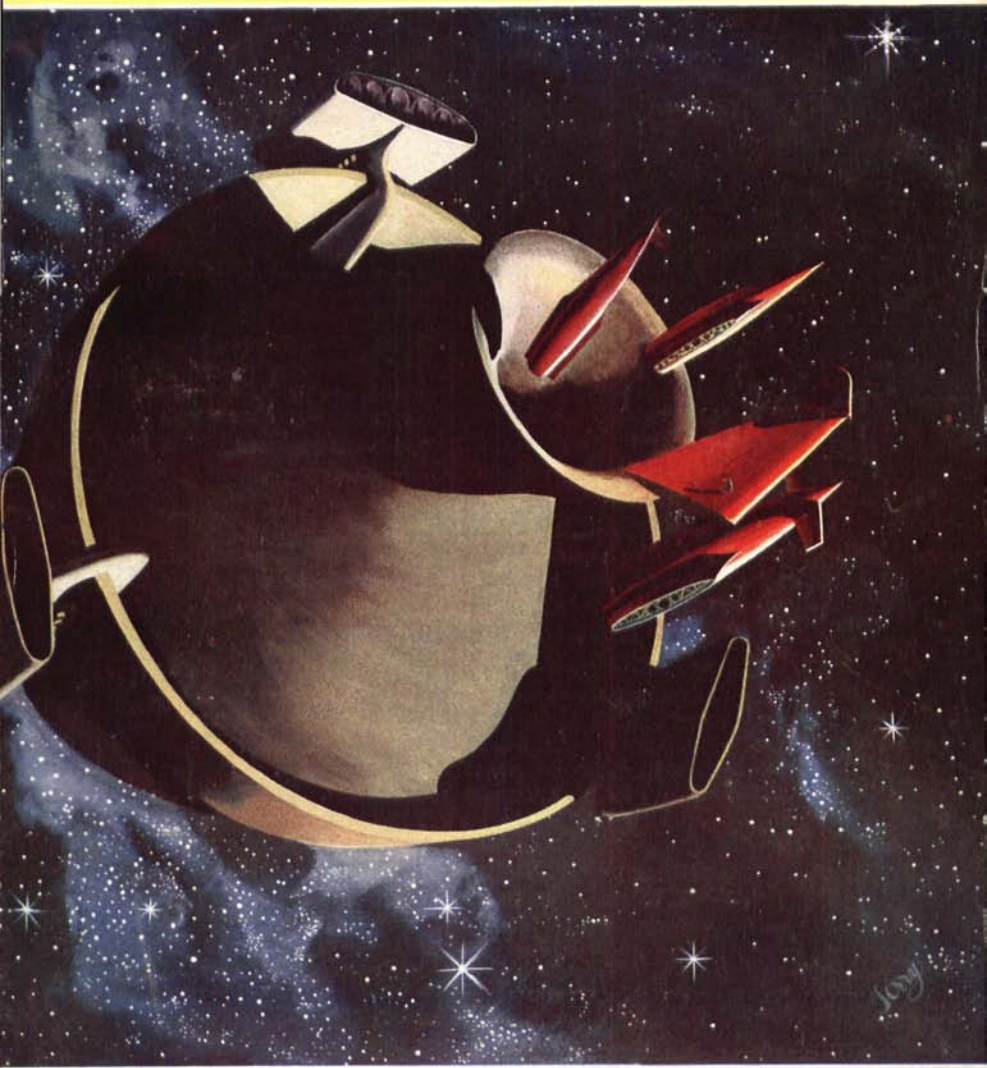


NEW WORLDS SCIENCE FICTION

No. 68
VOLUME 23
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NEW WORLDS

— PROFILES —

E. C.

Tubb

London



Commenting upon his two-year absence from our pages, Ted Tubb writes: "This was caused by the discovery of just how difficult it is for a writer to be an editor—and still remain an active writer. It is almost seven years since my first published story appeared in this magazine, and, looking back, it is obvious how much things have changed between then and now.

"It isn't just that events have been catching up with us—the major change has been the growing realisation that science fiction can only develop if both writers and editors bear in mind that, as John Wyndham has said, 'Stories are about people, not about things.'

"A spaceship in a story may make it science fiction but does not necessarily make it a good story. And a spaceship, unless it is essential to the development of the plot, does not even make the story real science fiction. To do that it has to be essential to the story in such a way that, without it, there would be no story. In *Requiem For A Harvey* I have tried to bear this in mind. The story is not so much about space travel as about the people who travel, or who have travelled, in space. Not about spaceships so much as the peculiar problems people living in such an environment may have to face. Without space travel their problems would not exist—and without their problems and the attempts at solving them, there would be no story."

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Editor : JOHN CARNELL

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TWO SHILLINGS

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Bridging The Gap

If you cast your mind back to last month's Editorial you may recall that I stated 1958 looked particularly attractive from our viewpoint. I couldn't at that time release all the plans we had in mind—publicity can be just as ineffective when issued too early as when it appears too late. However, I can now officially say that within a few weeks—on February 14th to be exact—our new magazine *Science Fiction Adventures* will be on sale. It starts off as a bi-monthly, alternating with *Science Fantasy*, but I wouldn't be the least bit surprised to see it a monthly before the year is out.

As a separate Nova entity it will very quickly speak for itself, because it will be considerably different in context to both *New Worlds* and *Science Fantasy*. Basically, the formula for all the stories will be action-adventure against a science fiction background, written by most of the leading American writers in the field. The original American edition, from which we are reprinting, is edited by Larry T. Shaw, one of the liveliest of live-wire editors to enter the publishing field in recent years, and who, in a very short space of time, has found the answer to the so-called missing "sense of wonder" older readers complain about.

For more than two years now we have been considering an additional title to the Nova list—we knew that the market needed a magazine of quality that would appeal primarily to newer readers—but all the necessary factors failed to come together until towards the end of 1957. During the past ten years science fiction in general has gained in popularity and acquired a measure of respect in literary circles, but in Europe and Australasia at least there has been no magazine published which would serve as an introductory medium. The gap between the stories published in the long established magazines and such so-called science fiction as published in other literary mediums is so great that the former are often incomprehensible to casual readers.

Science Fiction Adventures will very adequately bridge that gap, by stimulating thought-provoking stories packed with action—stories which, to newer readers, are filled with exciting possibilities as they come across the concepts for the first time. Such possibilities, however, are not confined entirely to new

readers. We know from correspondence that there is a great following in *New Worlds* for the space-action type of story, and part of our editorial policy has always been to have at least one such story in each issue whenever possible. To that large percentage of our readership, *Science Fiction Adventures* is going to be another bi-monthly *must* because they already know the literary skill of such American authors as C. M. Kornbluth, Robert Silverberg, Jerry Sohl, Algis Budrys and others whose names will be backing the new magazine.

From our vantage point today, with the first space satellites already encircling the globe and the threshold of space travel having been reached, we are apt to overlook the fact that the development of science fiction over the past sixty years has been by a series of stepping stones. Each stone has engraved upon its sides the names of the people who, in their time, popularised science fiction in one way or another—in the early years by authors such as Jules Verne, H. G. Wells, Edgar Rice Burroughs, Olaf Stapledon; publishers like Hugo Gernsback; editors like T. O'Connor Sloane, Fransworth Wright, F. Orlin Tremaine; and innumerable unknown personalities who added something to the whole. But always there has been the progression, step by step—until the 1939-45 war reduced publications to a minimum and at the same time rapidly decreased the gap between fact and fiction.

In the early post-war days *New Worlds* became one of the stepping stones bridging the gap for a newer readership being built up in Great Britain, but by the natural progression of events has developed until it caters almost exclusively for the regular reader. Looking round the existing field today we find that, despite various attempts by other publishers, there is nothing being published which can adequately be termed a stepping stone. I am more than sure that *Science Fiction Adventures* will prove to be the missing factor.

As a final testimonial, let me say that with over thirty years science fiction reading behind me, and despite many years professional experience, the stories in *Science Fiction Adventures* are once again giving me the same thrills I encountered a quarter of a century ago.

I hope you will find them the same.

John Carnell

We are very pleased to welcome author E. C. Tubb back to our pages and anticipate that we shall be seeing more of his work in the near future. In the following story his plot is centred round one of his favourite themes—space travel, but with the emphasis on the human emotions involved rather than the mechanical possibilities.

REQUIEM FOR A HARVEY

By E. C. Tubb

Troubles are like avalanches they begin from trifles and rapidly become devastating. Judd Wetzlar was no philosopher but he wouldn't have argued with the analogy. For some reason he attracted trouble and the cause was usually a simple inability to recognise the fact that rules were sacrosanct. Like on the way out when Holman had sent for him.

"Judd," said Holman, "I don't know if you do these things because you're plain dumb or just plain vicious but this time you've gone too far." He reached for a packet and Judd recognised it with a sinking of his stomach. "Don't you know the rules about unauthorised cargo?"

"That's part of my duffle," said Judd. "It's nothing to do with the cargo."

"So it's nothing to do with the cargo." Holman sighed like a man who is fast losing his patience. "It's still unauthorised. You're allowed five kilos of personal gear and you've got it, every gram. This is extra." He hefted the package again. "Two kilos at least. Well?"

"So I stretched my allowance, is that tragic?" Judd felt himself getting hot under the collar and recognised the symptom. He was in the wrong, technically at least, and because of that he was getting into a temper. "Hell, Skipper, we're allowed a little leeway, aren't we?"

"No." Holman was emphatic. "Sometimes, maybe, I turn a blind eye but that doesn't alter the fact that the inspectors could have my hide for it. Damn it, man, the rules are made to be obeyed and for a good reason." He hefted the package again. "Do you open it or shall I?"

"Why open it?" Judd was startled.

"Because I want to know what's in it." Holman stuck his thumb under the wrapping. He blinked at what he saw. "Seeds?"

"I was doing a chap a favour," said Judd sullenly. "He couldn't get them through his normal quota and asked me to help out." He grew uneasy at Holman's expression. "Hell, where's the harm in a few seeds?"

"If you don't know then I'm not wasting time telling you." Holman threw down the package. "Just remember Australia and the rabbit plague and then maybe you'll realise why the rules governing imports and exports from Earth are so strict." He stared thoughtfully at the other man. "How much were you getting for this?"

"Nothing," lied Judd. "It was just a favour."

Holman hadn't believed him, Judd knew that, and it made things, if anything, worse than what they were. It was the Captain's duty to report the infraction of the rules and Judd knew just what that would mean. He would be bounced, grounded, flung out of the service. He would be classified as unreliable, untrustworthy and a potential danger. Fifteen years of work and worry would be tossed into the discard and he would have to start all over again. And with the labour market in the state it was the chances of a busted spaceman weren't hopeful.

The fact that he had practically begged for it was no consolation at all.

Judd sighed and called for another drink. It would have been nice to have gone somewhere different to do his drinking but on Mars that was impossible. On Mars you live in a settlement or you don't live at all and the inside of a settlement is just like the inside of a ship only more so. True,

they had a bar, a recreation room of a kind, canned floor shows and mobile pin-ups, some ball games and other not too strenuous means of physical activity. And there was also gambling. In his saner moments Judd wished that gambling had been banned ; or that he'd never started trying to beat the bank ; or that he could win just for a change. Then, maybe, he wouldn't have tried to augment his income by breaking the rules.

He called for another drink to cheer himself up.

Outside, maybe, might be different. It would have been a change, at least, to take a walk over the ochre grit and sickly lichens of the Solis Lacus ; a novelty, even, to wander over to the mines and gawk at the refineries. And the sunsets, too, were said to be something special seen over the Thaumasia but Judd had always been too busy to find out, and what the hell, there was always the next time, wasn't there ? Only the way things seemed to be shaping up there wasn't going to be a next time and Holman had given orders that he wasn't to have a suit.

He flipped his empty glass, feeling annoyed because the plastic didn't ring as glass would have done, then felt more annoyed when Sam, the bartender, shook his head.

"No more for you, Judd, you're too big and heavy for me to have to put to bed." As a joke it was the poor relation of its kind.

"What the hell ?" Judd squinted at the clock. It showed twelve hours and ten minutes before take-off. "You trying to be funny, Sam ? I've got ten minutes of drinking time before the rules say you've got a right to stop serving me." He flicked the glass again. "Give."

"I make the rules in my bar," said Sam. "You've had enough, Judd."

Normally Judd would have laughed, thrown a joke and pleaded the old pals act. Sam would have laughed back, swapped gossip and maybe drawn a small one dead on time. That way both would have been happy and everyone would have been satisfied. But not this time. This time Judd was smarting under a grievance and he'd had a belly full of the rules and regulations without wanting to stomach more. He leaned forward and rested his hand on Sam's arm, his fingers pressing into the flesh.

"Don't throw your rules at me," he said coldly. "The book says twelve hours before take-off and that's the way it's

going to be." His hand closed a little tighter. "Now pour me a drink and let's hear less of your mouth."

Sam was stubborn and he could insist on his private ban and get away with it. But Sam had lived for a long time on Mars, he'd become adapted to the low-G and some of his muscles had taken a permanent rest. Judd wasn't a big man, not all that big, but he spent most of his time under one-G and some of it under fifteen. He could break Sam's arm without half trying and both of them knew it. And Judd, from his expression, would do just that.

So he got his drink and won his victory and sat there alone nursing them both. The drink tasted flat and the victory seemed cheap and empty and neither did anything to ease his grievance. It didn't seem fair that he was going to lose his career just because of a harmless infraction of the rules. It didn't seem just or right that he should be grounded, turned into a planet grubber simply because he had tried to do a man a small favour. He had forgotten that he was to have been paid for the service, forgotten too that though rules may be made to be broken, men who break them run the risk of being broken themselves.

But the worst part was that there was no way he could hit back, no jaw he could break, nothing he could do to score over the cold, emotionless rules and regulations which governed his life. Or so he thought until he met the Harvey.

Harveys are everywhere you go away from Earth. They are at every settlement, every off-planet bar. They may have different names, Smith, Ivan, Choy; different races, differently coloured skins, but two things they all have in common. They all share the generic name of Harvey and they all want to get home. Why they should be known as Harveys is just one of those mysteries. Maybe the very first one who discovered that he was stranded gave his name to all the rest, or maybe it was the name of the doctor who grounded him, but the other thing they have in common is no mystery at all. They are men who want to get home—and can't.

They are men who have run over their contract time and left the homeward journey too late. Some of them are drifters, ship-jumpers, optimists who hoped to make a quick fortune and return home in style. They are men whose health has broken down and who can no longer stand the strain of take-off and landing; men who have become too

adapted to low-G. to whom a return home would be a death sentence. Mostly they are old, usually they are broke, always they are tragic.

Mars has its share of Harveys and the settlement at Solis Lacus more than its share. Judd had met them before, spoken with them, shared their drinks and listened to their stories. None of them had ever touched him. The rules were strict and the penalties severe for both stowaways and those helping them; too severe for anyone in his right mind to even consider risking it. But Gus Easton was desperate and Judd was not wholly in his right mind.

"I got money," whispered Gus. "I got me a nice heap of cash to ease things when I get old." He blinked rheumy eyes and Judd wondered whether the man could ever have been young. "But what's the good of money to a man in a place like this?"

"It could help," said Judd. Sam had been right about that last drink, it had been one too many. His tongue felt thick and his head stuffed with cotton wool. Parts of his face felt numb and he found it hard to concentrate. He wiped his face, for some reason he was sweating, and stared around the bar. Gus had led him to a corner and the two of them sat in pointed isolation. The rest hadn't liked the way he had obtained his last drink and, with the clannishness of those who shared a common misery, they ganged up against the aristocratic spaceman. In twelve hours time, or less, he would be on his way home. They would have to wait years, maybe longer than that, and many of them could never see Earth again. Like Gus.

"Just to feel the rain on my face," whispered the old man. "To feel snow and watch the waves roll on the shore. To stand in a field of grass and breath real air and to stare at the birds." He sighed and his thin finger traced a pattern on the table. "I guess that you wouldn't know how it tears a man to remember the place he was raised in."

Judd shrugged, he didn't feel sentimental.

"It isn't that I can't pay for passage," said Gus. "I've offered double, treble passage money and still they turn me down." He dabbed at his eyes with the back of his hand. "And I'm getting old and if they don't take me soon I won't be able to go at all. I'll be dead."

"Tough," said Judd. He wished that he could stop sweating. "Why won't they give you passage?"

"They say it's the rules." Gus was bitter. "Some young squirt of a doctor tested me, or said he did, and then turned me down. He reckoned that I wasn't fit enough." He snorted.

"Fit! I can walk the legs off anyone half my age, work harder too. I'm fit enough." He mumbled to himself as if cursing a private devil. "That's the trouble with things these days. No one's got any guts anymore. They hide behind the rule book and you can't reach them no matter how hard you try. 'It's the Rules,' they say. Damn the rules!"

"That's what I say." Judd couldn't have agreed more. "Hell, if a man wants to risk his neck and is willing to pay his passage, where's the harm? So maybe he doesn't make it, but why not give him the chance?"

"I'd make it," said Gus. "They just won't let me go home and you know why?" His eyes narrowed. "I'll tell you why. They don't want us back home, that's why. They've got thing nicely sewed up their way and they don't want us coming back upsetting things. That's why they made all them rules."

He was wrong, Judd knew it, but knew too that arguing was a waste of time. You couldn't argue with a Harvey. You could listen to him, ask the obvious questions and maybe kill a little time. And Judd had time, the best part of twelve hours of it. He should have been sleeping, resting up for take-off, but he knew that he couldn't sleep. He was too restless for that and, though he wouldn't have admitted it, he was worried too. Soon he would be going back to an environment he had almost forgotten, to a world which had nothing to offer him, a world without a future and without security. The ramblings of the old man made little impact until he said something which jerked Judd to full attention.

"What was that you said?" He glared impatiently at Easton. "I'm not mad at you. What was it again?"

"Money," said Gus. "Two hundred thousand marks just waiting to be picked up in Berlin. I told you that I could pay for passage."

"I thought you were talking about Martian script not real money." Judd stared at the Harvey with new respect. Two hundred thousand marks was a lot of money. To him it was worth ten years salary, or would have been if he hadn't got into trouble. He found it hard to remember that he was due to be grounded. "How did you get it?"

"Some relatives died and left it to me." Easton glanced over his shoulder; no one was anywhere near them. "I suppose that I could have had it transferred but I had a better use for it. Passage money for one thing and a stake when I got back." He snivelled and rubbed his watering eyes. "Makes it even harder, all that money and still I can't get home. Hell, sometimes I'd give every mark of it just to tread on real dirt once again."

It was the come-on and, if Judd had been totally sober and in his right mind he would have recognised it for what it was. Instead of that he dreamed quick dreams of what two hundred thousand marks would bring; revised his dreams down to one hundred thousand, crushed the last flickers of conscience and walked into the trap. But it wasn't just for the money, not that. It was a means of hitting back at the rules as well. That was the important thing, to get his own back on the system which had broken him. But the money helped too.

It wasn't long before Judd realised just what he had got himself into. Sneaking the Harvey aboard hadn't been too difficult. Compensating the load for his added weight had been harder and he wasn't certain that he had managed it, but he had done his best. The real trouble came after take-off when the drive was cut and the ship put into spin. As usual they built up the centrifugal force to simulate one-G. Holman, Judd and the third member of the crew, Armitage, were used to it. Easton was not.

"I'm dying," he croaked. "I can't stand it." From the look of him he was telling the simple truth.

"You've got to stand it." Judd was curt. He'd been living on his nerves since before take-off and was suffering from strain. "I told you that it wouldn't be easy."

"You've got to do something." Easton writhed on the bunk, Judd's bunk, and his face looked ghastly in the glow-lights. "I can't take it much longer."

"Shut up! Someone will hear you." Judd stepped to the cabin door and tested the lock. Each member of the crew had their own cabin, privacy had been found to be essential to crew morale, and no one would enter another's cabin. It was the unwritten law which had made the entire scheme even remotely possible. If Easton kept quiet and didn't set foot outside no one would have any reason to suspect his presence.

But Judd would have to stand his normal watches. He would have to smuggle food and water to the Harvey ; his own rations mostly because the supplies couldn't stand a fourth mouth to feed. He would have to take care of Easton in other ways too, unpleasant ways for anyone who was not a nurse and he would have to do all this without acting in the slightest way abnormal. So, to begin with, he quarrelled with the other members of the crew.

There was reason for that quarrel. It allowed him to eat his rations in the privacy of his cabin ; permitted by the rules but unusual behaviour. It gave him an excuse to spend all his off-duty time apparently sulking in his locked cabin. It explained his irritation, caused by lack of sleep and short rations and it even explained why he demanded bromides and tranquilising drugs from the medical cabinet. Holman was reluctant to issue them.

"Are you sure you need these things, Judd ?"

"I'm sure." Judd was curt, he didn't want to argue about it. "According to the book I'm entitled to medical care. According to me I need tranquilisers." He held out his hand. "Give."

"Worried, Judd ?" Holman seemed disturbed. "Something wrong ?"

"Nothing that's your business." Judd snapped his fingers. "Do I get the stuff or don't I ?"

"I can't refuse any reasonable demand," admitted Holman. He counted out a half dozen tablets. "Here's your ration, let's hope that you feel better tomorrow." He shook his head in bafflement. "You never used to need this stuff, Judd. I don't like to see you using it now."

Judd grunted, thankful, at least, that Holman hadn't used his right to see Judd swallow the drugs before him. Not that he couldn't have used them, his nerves were rapidly going to hell, but Easton needed them more. The Harvey was in a bad way and getting worse all the time. Only the drugs seemed to have any soothing effect on him ; that and constant attention.

Easton lifted his head as Judd slid into the cabin and locked the door behind him. He let his head fall back as Judd reached him, the drugs and a cup of water in his hand.

"What you got there ?" His voice was a whine.

"Something to help you." Judd lifted the balding head on the scrawny neck, slipped the tablets between the bloodless lips and brought forward the cup of water. Easton spat out the tablets and, with a surge of surprising strength, knocked the cup from Judd's hand.

"You're trying to poison me," he screamed. "I know what you're doing. You want my money and you'd kill me to get it. You—"

"Shut up!" Judd was scared, sound travelled in spaceships and Easton was really using his voice. "Shut up or I'll sock you!"

The threat worked and Easton fell silent. He lay on the bunk, his thin features drawn and looking more like the face of a corpse than the face of a living man and his eyes, small and sharp, followed Judd's every move.

"I'm an old man," he whispered, his voice loaded with self-pity. "All I wanted was to see home once more before I died. You don't have to hurt an old man. You don't have to get rid of him because he's a nuisance."

"Stow it!" Judd stared at the spilled water and felt rage tighten his chest. He could have done with that water. He could have done with the food the old man had eaten and he was tired of sleeping on the floor. He stared at the cabin with disgust. Like all spacemen he was neat and clean in his habits, to be so was sheer survival value, and like most healthy men he hated sickness. Easton was sick. The bunk reeked of sickness, the cabin seemed redolent with his odour and the hygienic care he demanded was becoming a nightmare.

"You want my money," whined the old man. "You don't care about me, all you want is my money."

"What money?" Judd could have hit the Harvey in the face. "All I've had so far is promises. Maybe we'd better talk about it before we go any further."

"It's on Earth," said the old man quickly. "You know that. After we land I'll take you to the bank and give you one hundred thousand."

"That's not good enough." Looking at the old man Judd began to wonder why he had ever been so dumb. "All I've got is your word for it, I want something better than that."

"What?" Easton's eyes were very bright, very shrewd.

"Proof that you've got the money at all. Your bank book, something like that."

"I haven't got a bank book."

"Maybe you haven't any money either."

"I've got the money, all right." Easton sucked at his lips. "You don't have to worry about that." He eased himself on the bunk. "I'd like another mattress, this one's too thin. And I want some decent food, lots of it, and maybe you could get me something to drink." He blinked at Judd. "I've been thinking about things and I don't figure that you're treating me right."

The enormity of it almost strangled the breath in Judd's throat. After all he'd done and risked for this whining tramp to be spoken to as if he were a bell boy at a swank hotel. Easton reared up as he stepped forward.

"Don't you touch me," shrieked the Harvey. "Don't you hit me!"

"Keep your voice down!"

"You stay away from me." Gus sniggered as Judd swallowed his anger and stepped away from the bunk. "One hundred thousand marks is a lot of money. If you want to see the colour of it then you'd better begin treating me right."

"And if I don't?"

"You will," said Easton. The confidence in his voice was sickening.

Just when their relationship changed Judd wasn't certain but changed it had. At first he had been the aristocrat granting a favour and the Harvey had been the humbly thankful serf. Then they had become partners in misery, sharing a common fear of discovery, both aware of the risks they ran. Then, subtly, Easton had become the master and Judd the slave. And Easton was a hard master.

"More slop!" He scowled down into the bowl of food which was Judd's ration. "This the best you can do?"

"It's all there is." Judd felt hunger pains grip his stomach. "If you don't want it then I'll eat it." He reached for the bowl. Easton snatched it to one side.

"Not so fast, young fellow." He spooned the food into his mouth, making little slobbering noises as he ate. Incredibly the one-G gravity hadn't killed him and, as he adjusted to it, so his appetite improved. Judd was now eating only one meal out of three and was beginning to show it. Watching the Harvey eat his food Judd wondered if it would ever be possible for him to hate anyone more. Easton must have sensed what was in his mind.

"How much longer?"

"About twenty days, we're more than half-way."

"Sociable, aren't you?" Easton put aside the empty bowl. "It gets lonely in here and I could do with someone to talk to."

"You've got all you're getting." Judd scowled around the cabin. He hated to be with the old man but dared not be absent longer than he had to be. At times the unwanted company threatened to strain his nerves to the screaming point.

"I'm hungry," said Easton suddenly. "I want something to eat."

"You've just eaten."

"It wasn't enough." The old man stirred restlessly on the bunk. "I'm still hungry and want more. You'll have to get some for me."

Judd said a bad word, it gave him a perverse satisfaction to curse the helpless old fool. Hitting him was out, cursing him was the next best thing. He wasn't expecting what happened next.

Easton stared at him, heaved himself upright, opened his mouth and let out a scream. It was the loudest sound he had made while on board and it was shocking. Judd sprang forward and clamped his hand over the open mouth. Someone knocked on the door.

"That you, Judd?" It was Armitage, he sounded anxious.

"Who else did you think it was?" Anger and fear roughened Judd's voice. "What do you want?"

"I heard a yell, you hurt or something?"

"I nipped my thumb." Judd recognised the mistake as he said it. Now he would have to injure his thumb to keep up the pretence. "I'm all right." He waited until Armitage had gone then, without removing his hand, whispered in Easton's ear. "Do that again and I'll smash your face." He uncovered the old man's mouth. "What made you do that?"

"I don't aim to be spoken to like that." Easton wiped his mouth on the back of his hand. "I'm an old man and I'm not as strong as I was but that don't mean that I'm helpless. You just remember that, young fellow, or there'll be trouble."

"You scream like that again and there'll be trouble all right," promised Judd. His voice was thick with anger. "If they find you in here then we both get dumped in space. That's the penalty as laid down in the rules and Holman believes in sticking to the book."

"Maybe." Easton didn't seem worried.

"There's no maybe about it. Or are you thinking of bribing the captain if we're caught?" Judd felt that he had guessed right. "You'd be wasting your time. Holman couldn't be bought for ten times what you have, even if you had the cash in your hand. For you it would be curtains."

"For you too," reminded the old man. His eyes held a peculiar glitter. "Maybe you should think of that."

"I've thought of it," admitted Judd. He tensed as he saw what the old man was getting at. "Why you—"

"Stay away from me!" Easton sucked in a deep breath, ready to scream unless Judd obeyed. "Don't you upset me, young fellow, or I'll call the others in here. Then we'd both be in trouble. Me, I'm old and I don't reckon I've much to lose anyway. You, you're different, you're young and you've got a career. The way I see it you've a lot more to lose than I have."

"You—!" Judd had never felt such intense rage in his entire life. His very helplessness made him worse. As Easton had pointed out unless he toed the line then they would both die. And Judd didn't want to die. Easton didn't want to either, that was obvious, but that didn't matter. He was mean enough and capable enough of doing as he threatened and, to Judd, life was precious. He started as someone knocked on the door.

"Who is it?"

"Armitage. Holman wants you in the control room."

"Be right there." Judd waited until the man had gone, waited a little longer for his nerves to calm down and his rage to dissipate, then stepped from the cabin. It was almost like walking out of jail.

Holman was studying some figures when Judd entered the control room. He glanced up, nodded, then resumed his studies. Finally he tossed aside the computer tape and shrugged.

"Something wrong?" Judd was curious.

"Nothing serious." Holman picked up the tape. "I've just been checking the fuel position, we used a little more than we should have done during take-off and it's been worrying me."

"Much more?"

"No." Holman crumpled the tape and threw it into a waste basket. "Not more than the allowable margin but I like to get things straight. I guess that it's the perfectionist in me." He glanced at Judd's hands. "How's the thumb?"

"The thumb?" Judd blinked then remembered Armitage, the man had probably told the captain all about the scream and the excuse. Judd looked sheepish. "Well, I did nip myself but it wasn't on the thumb. That's what I told Armitage."

"I see." Holman appeared to be satisfied. "I want to talk to you, Judd," he said. "I think that it's about time we got together on a few things."

"Such as?" Judd swallowed to relieve his mounting tension.

"The way you've acted this trip. The dope you keep demanding, the way you keep to your cabin, lots of little things. They aren't normal for you, Judd and I'm getting worried about you."

"Why should you be?" Judd was bitter. "I guess that you won't be bothered with me after this trip anyway."

"Is that what's been the matter with you?" Holman seemed relieved. "I suppose that you've been under a strain at that, I should have guessed." He fell silent, his fingers toying with an edge of the control panel. "How long have we been together, Judd?"

"Five years, more maybe. Why?"

"You get to know a man pretty well after travelling with him for over five years. Some people might call you a trouble-maker but I'm not one of them." Holman paused again. "I guess that you feel pretty sick at the thought of quitting the service?"

"I'm sick at the prospect of being bounced out," corrected Judd. "But I'm not worrying about it. I'll get by." He rose to his feet. "And I can do without the hearts and flowers. You've a job to do and I guess you can only do it one way, your way. So I broke a rule and, in your book, that makes me due for grounding. All right, so it was my fault, but let's leave it at that. I can do without the phoney sympathy."

"You're not getting any," said Holman. His voice hardened as Judd moved towards the door. "Come back here and sit down ! I said sit !"

"You're still the boss." Judd was impatient to get back to his cabin and the Harvey but he dared not disobey the captain. He poised himself on the edge of the chair. "Well?"

"Let's cut the clowning, Judd." Incredibly Holman smiled. "You needed a lesson and I think you've had it. Rules are made to be kept, not broken, and the rules are there for a very good reason. All right, so some of them don't seem to make sense but they do, all of them. You can get away with breaking them maybe a dozen times, maybe more, but one day a broken rule could cost you your life. Your life and that of your entire crew."

"So ?"

"So I wanted to be sure you realised that." Holman stretched and his smile widened. "Before we left Earth I had an interview with the upper brass. I'll cut it short, Judd, but I'm being promoted."

"Congratulations," said Judd dryly, then his better nature asserted itself. "I mean that. It's not before time, either."

"Thanks." Holman relaxed even more. "The point is, Judd, that I had to find someone to take over from me when I move on. The choice is simple, you or Armitage." He silenced Judd with an upraised hand. "Let me finish. I wasn't too happy about your smuggling attempt but I wanted to be fair. I've noticed you getting progressively worse over the years and I've a good idea as to the reason. I know the cure, also." He leaned forward, his hand resting on Judd's knee.

"Some men, Judd, can't help but kick against authority. It isn't that they are bad men, unreliable, disloyal, untrustworthy, but they just can't help expressing their individuality in their own way. Armitage is a good man, steady as a rock but without imagination. He could take over but, if he did, he would never get any higher. You would be different."

"I don't get it," said Judd. He felt his heart begin to accelerate. "What are you driving at?"

"Can't you guess?" Holman became almost fatherly. "When a man like yourself begins to fight against authority it's usually due to frustration. You love the service, you admitted yourself that the thought of leaving it made you

sick, and the way you've been acting is direct proof of how the threat of dismissal affected you. Knowing the cause makes it easy to find the cure." Holman rose to his feet and held out his hand. "You take my command after we reach Earth. Congratulations, Captain!"

It was almost too sudden. It was what he had always wanted, Judd knew that, and he knew that Holman was right in what he said about Judd's defiance of the rules. Given responsibility then he would become responsible. No more getting his own back by petty infractions. No more chips on the shoulder. No more chafing at routine or frustration at being left behind, washed in a backwater while others forged ahead. Promotion was the one thing he had wanted to make him the happiest man in the System.

And then he remembered the Harvey.

Easton was asleep when Judd returned to the cabin. He stirred a little as the door clicked shut but didn't wholly wake. Judd stood, staring down at his unwanted guest, reliving the tension he had gone through after Holman's announcement.

It hadn't been an easy time. Almost he had been tempted to find relief in confession, to take advantage of Holman's obvious regard and tell him everything. Fortunately he hadn't yielded to the easy way out.

"I'm taking a chance," Holman had said after the shock had died off. "That smuggling business was raw, it was lucky that I found that package. People in our position are trusted to a great extent, we have to be, but the penalties if we slip are all the more severe. I've covered the smuggling but I'll cover nothing else. You've got your chance, Judd, what you do with it is your own concern."

Judd could imagine Holman's reactions if he ever learned about the Harvey.

On the bunk Easton stirred a little, his mouth falling open, dry, harsh rattling sounds coming from his throat. He looked a sick man, his previous appearance of good health had totally vanished. The one-G gravity was tearing him down, disrupting his internal organs. His body had fought against it, overcompensated and was now giving up the struggle. If he was to live he needed urgent medical attention, but Judd knew that he couldn't live.

Easton was going to die. He was going to die during the landing if not before. He was sick and he couldn't take the

shock of deceleration. He would be dead before he reached Earth and Judd's future would be dead with him.

And yet, nothing had really changed, it had merely become more immediate. Judd had given little thought to what would have happened when they landed. If the Harvey had died then he would have been under Earth law and his own life would have been safe. If Easton had managed to survive then he would have smuggled him off the ship in some way or, if discovered, then they would both have had the satisfaction of breaking the rules and proving them wrong.

But now things were so utterly different.

The old man's head rolled on the pillow. His eyes opened and stared blankly at the glow-lights above. They moved, horribly, in their sockets and focussed painfully on Judd. The mouth worked, the adam's apple bobbed in the scrawny neck and a thin thread of sound crept past the bloodless lips.

"Water . . . water . . . wa . . ."

"Take it easy." Judd found it within himself to feel pity. "I'll get you a drink."

The drink took longer to obtain than he guessed. Armitage met him in the passage and, naturally he knew of the promotion. There were the inevitable congratulations, the unspoken acceptance of the fact that, now Judd was firmly established, he would revert back to his normal self. And all the time he was smiling and cracking jokes Judd's nerves were screaming for him to get away, to get back to his cabin.

Easton was worse when he returned.

"Water!" Thin fingers clawed at the cup and a trickle of fluid ran over his stubbled chin. Judd supported the old man while he drank then, gently, let his head fall back to the pillow.

"Thanks." Easton swallowed, painfully, and his hands twitched on the covers. "I'm dying," he whispered. "Dying. I'll never see home again."

Judd didn't answer. there was nothing to say. Only a little while ago Easton had been the master and he the slave, forced to do the other's bidding because of fear of discovery. Now their relationship had subtly altered again. Now it was Judd who was the master and, strangely enough, from the very same motives which had made him a slave. Now

he feared discovery more than ever but, because he feared it so much, he had strength to conquer it. And yet he hesitated.

"Dying!" Easton stirred and energy seemed to flow into him. "I won't die! I won't!" He reared up on the bunk, his eyes wild. "I want a doctor! Get me a doctor! Damn you, you're trying to kill me! Help! Help!"

It was delirium, the ravings of a man at the end of his life but whatever the cause it was noise and noise had to be avoided at any cost. Judd snatched the pillow from the bunk, pressed it against the distorted face and muffled the sounds. That was all he wanted to do, muffle the sounds. That was all his conscious mind intended but his subconscious interpreted his desires in a different way. He muffled the sounds, all right, but not just for the moment. He muffled them permanently. When he finally removed the pillow Easton was dead.

Holman sat in the control room and listened to the workings of his ship. Spaceships are never silent, always there are the tiny, transmitted sounds of the machines which give it life. The hum of the engines is the heart, the tiny, almost sub-audible clickings of the relays the brain, the sigh of the air conditioners the lungs, the footsteps, words and movements of the crew the pulse of blood. To Holman, as to every captain, his ship was a living personality.

But he did not sit and listen alone. Armitage was with him and he was there through choice not from accident. Not that he would ever guess that for Armitage, as Holman knew, was a good man but an unimaginative one. It was as well that it was so.

"Judd's tickled about his promotion," said Armitage, and there was no envy in his voice. "I met him, he was getting a drink, and I could tell."

"When was this?" Holman glanced at the tell-tales on the control board then fastened Armitage's eyes with his own.

"A little while ago, just before you bumped into me." Armitage stretched, his hands locked behind his head. "He looked more like his old self."

"He did?"

"Almost, he still seemed in a hurry to get back to his cabin."

"Nothing in that," said Holman. "He's built up a habit pattern during this trip and it will take him a little while to

break it." From the corner of his eye he saw one of the tiny lights flare into brief life. "I think that you'll find him different from now on." Another lamp flared and died. "Very different."

"I'll miss you," said Armitage. "I think we shall both miss you." He laughed, a little self-conscious of his betrayal of emotion. "Odd about us, what we are I mean. Sometimes I think that the ship is a self-contained unit, a tiny universe all on its own. We, Judd and I, are the planets and you are the Sun."

"Poetic." Holman was shaken, Armitage seemed to be more imaginative than he had guessed. "Did you read that somewhere?"

"I must have done." Armitage thought for a moment. "Yes, I'm sure I did. It was a book of poems I picked up during a stop-over on home. Some of it I couldn't understand but some I could. About ships, for example, the author drew an analogy between the ship and the crew, their relation to their ship and the relationship of the Captain to them."

"Like a father to his children?"

"Yes, you know the poem?"

"I've heard of it." Holman rose, glanced once at the control panel, let his eyes drift over the screen then led the way to the door. "I'll walk back to your quarters with you."

Their path led them past Judd's cabin and, for the first time during the trip, the door stood open. Holman didn't pause as he accompanied Armitage to his own cabin but on the return trip he did pause, looking into the cabin and then staring at Judd.

"Everything all right?"

"Sure, why shouldn't it be?" Judd sat on his rumpled bunk and stared directly at the captain. "Want to come in?"

"No." Holman smiled his refusal. "Just looked in to make sure that everything was as it should be." He left before Judd could answer, his smile vanishing as he walked back towards the control room. There, sitting in the brain of his ship, he felt the weight of responsibility resting heavily on his shoulders.

He was taking a chance and yet, all life consisted of taking chances. And was it such a chance at that? A man had to learn respect for law and order and that respect had to come from inside himself not be forced externally. There are times

to obey rules and times when it is wiser not to notice the obvious and, if by so doing, a man was thought to be a fool, was that not better than the inevitable alternative? Holman didn't know but, thinking of it, he gained comfort from what Armitage had said. He was, in a sense, the father of his crew. It was his responsibility to ensure that his ship passed into safe hands.

And he was certain now that he had chosen correctly. A man had to be strong in order to be wholly a man and there is no room for weaklings in space. He had given Judd his chance and Judd had proven himself. The morals of what he had done he ignored, two wrongs do not make a right and, in the final essence, the ship came above all.

Holman sighed, staring at the winking lights of the tell-tales, the tiny lights which told him of the operation of every single piece of equipment in the ship. His eyes lifted, stared briefly at the screen and the dying fleck of green on the radar screen. The sight reassured him that his choice had been the right one.

A man must love a thing if he is able to kill for it.

E. C. Tubb

THE LITERARY LINE-UP

Eric Frank Russell's newest novel commences next month as a serial. Part 1 of "Wasp" sets the pace for a story which never flags in interest for a single page—it is the story of one man who is sent to sabotage an interstellár Empire; a sheer impossibility on the face of it, until you realise how simple such a factor could be made when entrusted to an intelligent man. In the competent hands of Britain's leading science fiction writer the plot literally *lives*.

The first of our new cover paintings will be featured next month, and there will be stories by Robert Silverberg, John Boland, Harry Harrison, and several others.

Story ratings for No. 64 were :

- | | | |
|---------------------------------|---------|--------------------|
| 1. The Menace From Earth | - | Robert A. Heinlein |
| 2. The Uninhibited (conclusion) | - | Dan Morgan |
| 3. A Sense Of Wonder | - - - | D. M. Parks |
| 4. Mate In One | - - - - | Lan Wright |
| 5. Sense Of Wonder | - - - - | Bertram Chandler |

THE UNWANTED

Travel at speeds faster than light makes an interesting basis for many types of plot. In the following story Dan Morgan uses the contraction-of-Time angle—his voyagers living through five years of their lives while back on Earth, five hundred years have passed. The return of the stellar travellers, however, is not the joyous occasion they expected.

By Dan Morgan

They stood in the control room of the *Endeavour*. Five men back from the stars. Ten eyes gleaming with expectancy, watching the image of the greeny-blue planet they called home growing in the forward vision screen.

"So long . . ." breathed Roberts, the straw-haired young electronics operator. "What will they think of us?"

Dane glanced down at the strong young profile, alert from long habit, always the observer, ready to detect the first sign of instability. Then he checked himself, remembering with a surge of relief that his five years as commander of the *Endeavour*, one of the two ships carrying out Operation Star Chart, were almost at an end. They had seemed so long that sometimes he fancied that he alone had not remained youthful through the miracle of subjective time, but had lived out the full five centuries which had passed on Earth whilst they had been away.

"I wonder . . ." said Jameson, the astrogator, a tall, stooping man with a lean, scholarly face. "As yet we have not seen one ship, no sign of life or development on the outer planets. Could it be that they have abandoned space? Or

that the final war came after all, bringing such chaos that we were forgotten?"

Bohr, the ecologist, shifted his flabby bulk on the acceleration couch which was his usual situation. "Shall we wait and see? They may have some new drive, something that would not have been detected by our pickups."

"No—I think they must have spotted us as soon as we cleared the orbit of Pluto," said Dane. "Now they are waiting for us to identify ourselves to one of the satellites."

"My God! What do you all think you're at—a wake?" Lansing, the engineer, turned on his companions with a sneer. "What difference does it make, any of it? We're almost home!" He pointed at the screen. "Down there are people, real people—billions of them. We shall be heroes—don't you understand? Blasted heroes!"

"Have another try to reach the satellites, Johnny," said Dane quietly. Roberts bent over his control panel.

"Why bother with that if they've seen us approaching?" Lansing was drunk with the elation of the moment, the release of five years of pent-up home sickness to which he had never even admitted. "Call Earth and tell them to lay out a red carpet a mile wide on Earth Central landing field."

"My orders are to contact the satellites on completion of our mission," said Dane firmly.

"All the time we do things *his* way!" snarled Lansing, scanning the faces of the others for some sign of agreement. "I've been a space engineer all my life, helped to design this ship, and they put a groundhog colonel in charge. A Psyche Corps witch doctor who does nothing for five whole years but spy on us and probe our minds."

The faces of the other men showed embarrassed anger. They had come to realise long ago that only a Psyche Corps man could command and *maintain* command throughout the expedition during which five widely varying personalities were forced into unceasing contact by the small confines of the ship. But Lansing had nursed his antagonism and jealousy for the whole five years, until it had grown inwards, reaching psychotic proportions.

"*Why* can't we land on Earth? Haven't we earned that much?" demanded Lansing. "What's the matter with all of you—are you frightened to speak up and demand your right?"

"Drop it, Lansing," said Bohr wearily. "What difference does a few hours make now?"

"Why, you fat slob . . . !"

Dane placed a restraining hand on the arm of the husky engineer. "There are sure to be certain formalities, but it won't be long."

"Thanks—for nothing." Lansing jerked his arm away and headed out of the control room in the direction of the engine compartment.

"He's in bad shape." Bohr eased his bulk upright on the couch and wiped the ever present perspiration from his shining forehead.

Dane nodded, thoughtfully. "Yes, I only hope that they will be able to do something for him when we get back to Earth. Five hundred years of psychiatric research should have given them the necessary techniques . . ."

Bohr gave his ponderous smile. "Without your help he would have been a hopeless psychotic-years ago. So I don't see that you have a lot to blame yourself for."

"It's only a jury-rigged sanity," Dane said. "He's in no condition to weather any kind of emotional storm. I'd like you all to remember that and be as tolerant with him as you can."

"He's not been much use as an engineer for months," Jameson said dourly. "The main lock is still jammed from that time when the meteor clipped us."

"That's not important," Dane said. "We can use one of the emergencies when we land."

Robert's fair head bobbed round excitedly. "I'm getting something now!" He made a slight adjustment and a voice sounded in the speaker above the radio panel.

"Satellite Three calling approaching ship . . . Satellite Three calling approaching ship . . . Please identify yourself."

"I'll talk to them," Dane said tensely.

Roberts switched in a microphone and handed it to the commander.

"U.N. ship *Endeavour*, returning from Operation Star Chart, Colonel Charles Dane, Psyche Corps, commanding. Request landing instructions."

"That will give them something to think about," whispered Bohr. "If admin is still anything like it used to be they'll take about six months to find the file on us."

"Welcome home, *Endeavour*." There was no hint of surprise in the voice as it replied after the barest pause. "Please pull alongside Satellite Three. Disembarkation mechanism marked with the standard circle cross will lock onto your main hatch automatically when you are in position."

"Well, I'm damned," said Bohr. "Emotional so and so, isn't he?"

"Our main hatch is jammed," replied Dane. "We shall have to disembark by emergency lock in space suite and board you."

"Please pull alongside Satellite Three—disembarkation mechanism marked with the standard circled . . ." The satellite began to repeat, disregarding Dane's statement.

"There's not much point in arguing with a reel of tape." Dane handed the mike back to Roberts. "The satellite must be entirely robot controlled. Bring us in, Jameson."

The astrogator walked over to the controls and began to manoeuvre the ship into position, matching velocity with the satellite. The shape that loomed in the starboard view screen was quite unlike the large wheel type of satellite they remembered. This one was only slightly larger than the ship itself and perfectly spherical.

"Right on the button, Jamie," murmured Bohr, pointing to the circled cross painted in white on the side of the sphere.

Part of the outer shell slid aside and a proboscis of silvery, flexible metal began to extrude itself from the opening, reaching across the gap between the ship and the satellite.

"How the devil can a mechanism like that adapt itself to all the different kinds of ships there must be by now?" said Dane.

"Perhaps it was made especially for *this* ship," said Jameson. There was a slight metallic click and a shudder ran through the hull of the *Endeavour*.

"Disembarkation mechanism is now locked onto your main hatch." The voice of the satellite spoke again. "You may now open your main airlock and disembark. There is no need for spacesuits—the pressures will be automatically equalised as soon as your lock opens. All, repeat *all*, members of your crew will disembark in a body and come aboard the satellite for landing instructions."

"So much for the schemes of mice and men." Bohr grinned expansively. "Beautiful piece of engineering, that

disembarkation tube—pity we can't use it. I suppose we'd better get into our personal sweat boxes?"

"Disembarkation mechanism is now locked . . ." the satellite began to repeat.

"All right, Johnny," Dane said. "You can kill that, now."

"I'm coming with you?" asked the youngster, eagerly.

"Of course," Dane smiled. "You heard what the man said."

"The hell with it!" Lansing was standing in the doorway. "Five hundred years—and nothing to meet us but a blasted robot space station and a tape deck! The ungrateful swine! Why don't we go right on down and make a landing at Earth Central?"

"Because those are not out instructions," said Dane calmly. "They obviously have good reasons for wanting us to board the satellite first—so we'll do as they say."

"He's right," said Bohr. "Let's take orders without a gripe for once, eh? And don't count too much on that welcome back heroes business, either. We all volunteered for this trip with our eyes open—they don't owe us a thing."

"Five years cooped up in this can and you can talk like that?" Lansing's face was livid. "Five years to remember all the things and people you can never hope to see again . . ."

"That's enough!" snapped Dane. "All hands to emergency lock two with space suits, at the double!"

Roberts rose from the radio control seat. "For me, I'd be glad to get back to Earth even if they made us walk the next couple of thousand miles."

"I don't think there's any danger of that, Johnny," said Dane. "Come on, lad, let's get moving. The ship can take care of herself for a while."

"Just a minute," Jameson intervened. "What do we do if there isn't any way into the satellite other than by through that tube?"

"You've got a point there, Jamie," admitted Dane. "Perhaps we had better take a nucleonic torch along, just in case."

"You mean you'd cut your way in, if necessary?" asked Roberts as they walked along the corridor towards the lock.

"Why not? If the thing isn't manned we can't do much harm. In any case, the compartments are bound to be self-sealing. How else would you build a satellite unless you wanted it to be a sitting duck for meteors?"

Lansing was already standing by the lock in his space suit when they arrived, and Bohr was swearing and struggling to force his obese body into his.

The five men jetted their way across to the satellite without incident.

"Right, we'll separate here," said Dane, as their magnetic boots clicked into place on the outer hull of the sphere. "The first man to locate anything that looks like an airlock can call the others."

Dane picked his way over the mirror surface, listening to the mumbled ramblings and cursings of Lansing which came over the suit radio. The man was in a highly charged emotional state and growing worse. It would have been better to have left him aboard the *Endeavour*, but that would have meant placing him under restraint and aggravating his condition further.

"I've got it!" Robert's hail came a few minutes later. "Looks like the ordinary standard type air lock."

"Right, stay where you are," said Dane. "You all heard that? Let's go!" The other four suited figures converged on Roberts.

Dane shifted the nucleonic torch onto his back and bent down to examine the wheel-locking mechanism of the hatch. "Looks like strictly a one man job. Let's open it up."

A moment later the hatch was open, revealing the chamber beneath. As Dane had predicted, it was just large enough to hold one suited man.

"Well, what the hell are we waiting around here for?" said Lansing irritably, pushing forward. "Let's get inside."

It was impossible to detect the man's expression behind the one-way glass of his helmet, but the tone of voice was enough for Dane. Lansing needed watching closely, at all times from here on. There could be no question of allowing him to be the first aboard the satellite.

"All right, Johnny," said Dane. "It's your privilege—you found the thing."

"Thanks, commander!" The young man's voice was high-pitched with the excitement of the moment. He began to lower his cumbersome, suited body into the hatch.

"Give us a commentary as you go through, Johnny, just in case there are any snags," Dane said, wondering what he himself was feeling so nervous about. After all, the boy was

the obvious choice, more stable than Lansing and more agile than either Jameson or Bohr.

"Sure thing!" Roberts pulled the cover down over his head. "This is like being inside a fridge with the door closed . . . except that the light is on. There's a red one with a pressure gauge beneath it, winking on and off on the panel in front of me. There are no controls for the inner door—it looks as though the whole thing is automatic."

There was a pause, then Robert's voice came through again. "Yes—that's it! The red light has gone out now and the gauge is way up. The green light is flickering now . . . steady. The floor of the lock seems to be falling away gradually. Here I go, men! Sliding down a short ramp now into a small cabin with glowing walls. Bare sort of a dump, with no furnishings at all, just the pale illumination coming out of the walls. The inner door of the hatch is closing up again now. Come on in, fellers, the water's fine!

"I'm taking off my headpiece now. Let's see if their canned air smells any better than ours. You know, I've often wondered what sort of a reception they will give us when we get back. Maybe some sort of a Liberty Day parade with all . . ."

Robert's voice stopped abruptly in mid sentence.

"Hallo, Johnny! Can you hear me?" asked Dane urgently. There was no reply.

"He probably switched off his radio by accident when he removed his helmet," suggested Bohr.

"Maybe," said Dane uneasily. "I'm going down there to take a look." He bent down and started to open the hatch again. "I'll give you the O.K. when to follow."

As soon as the hatch closed over his head the process of compression began to take place exactly as Roberts had described it. Finally the green light flashed on and the floor of the lock fell gently away. Dane slid down the ramp into the small cabin.

A few feet away from him, face downwards on the floor, lay the twisted form of Roberts. His helmet was still clutched convulsively in one hand.

"Johnny!" Dane struggled clumsily to his feet and moved over to the prone figure. Rolling the radio man over he saw that the once handsome young face was contorted,

frozen in an ugly grimace of shock and pain, and tinged blue. He was quite dead.

Dane knelt there for a moment, sick at heart, wishing vainly that he could reach inside his helmet and wipe away the ice-cold perspiration which rolled down his forehead.

"You all right down there, Dane?" Bohr's voice broke into his reverie.

"What's the holdup?" asked Lansing angrily. "How much longer are you going to keep us standing out here?"

The one thing that Dane did *not* want right now was Lansing. "Send Jameson down next," he said quietly.

He waited impotently whilst the inner door of the lock slid back into position. There was nothing he could do for Roberts. What had happened to the boy he was not sure. Certainly it could not be the normal asphyxiation through airlessness. The gauge on his own suit showed that the pressure in this room was well up to normal. His thoughts dragged round in a leaden circle, blaming himself for Robert's death. Perhaps this lock had never been intended for use . . . by human beings, at any rate. He should have followed the instructions of the satellite, even if it had meant cutting away the main lock in order to get through the tube.

At last, Jameson's long figure appeared, sliding down the ramp. "What the . . . ?"

Dane waved him to silence. He did not want Lansing to know what had happened yet. "Both Jameson and I are switching off our radios now, Bohr," he said. "Wait until we call you again before coming down—*those are orders.*"

He walked over to Jameson and touched helmets. "I found him like this when I came down. He must have died as soon as he opened his suit. What do you make of it?"

Jameson, cool and methodical as always, bent for a moment over the corpse, then unlatching the pack from his back he began to test the air of the cabin with a small analysis kit. When he had finished he beckoned Dane across.

"Cyanogen! At least twenty-five per cent. The poor kid must have been dead before he hit the deck," said the astro-gator.

"But what *lives* in an atmosphere of cyanogen?" asked Dane.

"Nothing *human.*" Jameson's voice sounded hollow in his helmet.

"Perhaps some accident to the air conditioning system, if this thing has been up here for a long time unattended," said Dane, without really believing it himself.

"No," replied Jameson. "But we must remember that we do not know the purpose of this cabin, and were certainly not expected to enter by it."

Dane needed no reminder of that fact. "I'm going to call the others down now," he said. "Then we'll explore this thing . . ." He stopped as Jameson placed a hand on his arm and pointed the other up at the wall. "A camera lens ! That could mean that there is somebody aboard this thing watching our every move."

"Aboard—or back on Earth," said Jameson slowly.

"I'm going to call the others down," Dane said again. "We're safe enough if we keep our suits on."

"Possibly," said Jameson without enthusiasm.

Lansing arrived down first. "Young fool !" he said, looking down at Robert's body. "Suppose he couldn't wait for the pressure to be equalised before unlatching his helmet?"

Dane let it go at that, rather than excite the man further. Dane could hear the fat man's laboured breathing as Bohr joined them.

"Poor little Johnny—he had so much to live for", Bohr said. "So that's what all the silence was about, eh ? Now what ?"

"We're going to find out," Dane said grimly. He strode towards the door of the cabin. The lock yielded easily at his touch and he passed through, the others close behind.

They were in a large, well-lit chamber, the floor of which seemed to reach clear across the diameter of the sphere. The walls were dotted about at intervals with camera lenses like those which they had seen in the small cabin. At about ninety degrees to their left was the opening of the disembarkation tube, at the end of which they could see the still closed main lock of the *Endeavour*.

Looking upwards Dane saw a gallery running round the inside of the sphere. Suspended in the centre was a large, funnel-shaped device. A spiral staircase some yards along to their left led up to the gallery, whilst straight ahead of them a flight of stairs led down into the bowels of the satellite.

"You and Bohr take a look up there," Dane said to Jameson. "Lansing and I will go downstairs."

Conscious of the watching eyes of the cameras Dane led the way down. Glancing at the radiation counter on his sleeve he saw that the needle was well up into the red danger zone.

"Without our suits we would be fried in here within two minutes," said Lansing. "What the hell sort of death trap is this, anyway?"

In the centre of the lower chamber of the satellite was a large reactor furnace. The needle of Dane's counter was slap against the end stop as they walked across.

"What do you make of it?" he asked Lansing.

The engineer moved over to a control panel set on a console a few feet away. He pored over the dials and indicators, mumbling to himself. Dane reflected that at least the novelty of the circumstances seemed to have taken the engineer's mind off his own personal problems for the time being and made him act like a rational being.

"We've found the source of the cyanogen." Jameson's voice came through the helmet speaker. "There's a retort up here which seems to contain mercuric cyanide, being heated by pipes coming from down where you are. The funnel you saw is part of a fan rig that is dispersing the gas throughout the satellite. If we had opened up our main hatch when that tube made contact we would have been dead within a few seconds."

"We'll be dead anyway, if we don't get out of here fast!" shouted Lansing, moving over towards Dane. "That thing is liable to blow any minute now."

"Isn't there anything you can do to stop it?" asked Dane.

"I've been trying. The controls on that console have no effect at all. And yet the reaction could not have been going on for long, or it would have blown before now. It must only have been activated recently."

At the time when we made our first contact with the satellite, thought Dane. "Right! Hear this, all of you. Lansing says that this reactor is reaching critical stage. We're getting out of here. No time for further investigation—head for the airlock!"

Jameson and Bohr were already waiting at the door of the small cabin through which they had entered. As they walked in Dane was once again aware of the watching eye of the cameras. Jameson stopped, looking down at the body of Roberts.

"We'll have to leave him here, I'm afraid." Dane walked over to the ramp and looked at the underside of the airlock. And stood, quite helpless.

"What are you waiting for?" shouted Lansing. "That pile isn't going to hold much longer."

The underside of the lock was perfectly smooth. There were no visible controls, or means of opening it. It was like standing on the inside of a rat trap. The airlock was strictly a one way job.

"They don't leave much to chance, do they?" said Jameson, coming up behind him. "What now?"

Bohr's wheezing voice filled his headpiece. "For Pete's sake, Dane. What have you been carrying *that thing* slung over your shoulder for all this time?"

Dane remembered the nucleonic torch. Then shook his head. "No—it would take too long. When I've cut through the bottom here, there's still the hatch at the top to get through. And that is bound to be one way, too." Getting aboard the satellite they had not even bothered to notice these things. They had not seemed important then.

"You've got to try!" screamed Lansing. "Anything is better than just standing here, waiting."

"There is *another* way—a rather better one, I think," said Jameson's cool voice.

"What is it, man?"

"The connecting tube," said the astrogator. "It is flexible and only single thickness. You should be able to cut a way through it in a few seconds with that tool."

Dane wasted no more time in discussion. Gripping the nucleonic torch, he dashed from the room, closely followed by the others. Ignoring the danger of using the torch in such an enclosed space, he set to work on the side of the tube immediately, trusting that the shielding of their suits would keep them safe. The tube resisted the ravening power for almost a full minute, then a patch grew white hot and formed a molten bubble which exploded outwards into space under the atmospheric pressure of the interior of the satellite. Soon there was a hole large enough to permit the passage of their suited bodies.

"Our troubles aren't over yet," Dane said as they reached the hull of the *Endeavour*. "If we don't blast off before that thing goes up, it will take us with it."

The four men scrambled into an airlock and slammed the hatch behind them. Eons of impatient, nagging time dragged past as the chamber slowly filled. At last the green light over the inner door flashed on. Pushing it open they rushed into the ship, unlimbering their helmets as they moved. None of them dared voice the panic that was yammering at their heels.

"Engine room, Lansing!" shouted Dane. "We want maximum power—in a hurry!" The burly engineer was already on his way.

Dane and Jameson headed for the control room, with Bohr wheezing along behind them. The spherical bulk of the satellite loomed huge in the viewscreen—a huge atomic bomb, fast reaching its critical stage. Any second now it might erupt in a flare of raging force that would surely take the *Endeavour* with it into oblivion.

Every man was tensed, body rigid, as Dane's fingers played over the firing keys. No course was necessary—they just had to move quickly, anywhere away from the menace of the satellite. A pilot light from the engine room flashed on, and a split second later the whole ship shuddered under the combined explosive force of its rear jet tubes. In the screen they saw the disembarkation mechanism bulge and stretch incredibly for an instant, then snap away. The acceleration hit them like a brick wall, slamming both Jameson and Bohr to the deck.

Dane clung to the pilot chair, fighting the force that tore at his vitals. The satellite began to decrease in size on the rear view screen. Then the whole screen blanked out in a mass of livid flame as the outside cameras were overloaded.

"It's gone!" breathed Dane. The screen began to clear gradually and the other two men struggled painfully to their feet. Where the satellite had been, a roiling, bubbling mass of incandescent gas was slowly dispersing into the black maw of space.

"But for the grace of God . . ." said Jameson softly.

There was a clattering in the corridor behind them and Lansing appeared, blood from his mashed nose streaming down his face. "We made it!" he yelled jubilantly, staggering across to the screen. "Did you get that acceleration? Now let's make that landing, Dane."

"No," said Dane. "We've got to find out the reason behind this before we try to land on Earth." He was thinking again of the cameras on the satellite. If they had been transmitting images, who had been observing?

"The hell with that !" burst our Lansing.

Bohr, holding a hand painfully to his great chest, intervened. "No, Lansing—he's right. That satellite was nothing but a giant man trap, waiting there for us to return and activate it. We would be dead men now if that main lock hadn't been jammed and we had obeyed the instructions from the satellite."

"Even then, we wouldn't have made it if we hadn't been carrying the nucleonic torch," Jameson reminded them. "It was a very efficient trap."

With Dane at the controls still they were fast approaching another of the satellites. Lansing waved a hand at the screen and said : "What do you intend to do ? Board this one and give them another chance to kill us ?"

"Take over, Jameson." Dane rose from the pilot chair and walked over to the radio. "I'm going to call Earth. There *must* be some reasonable explanation for all this."

The speaker crackled and moaned. Then a voice, hoarse and urgent, unlike the measured tones of the satellite, surged into the room. "Earth calling starship *Endeavour* . . . Earth calling star . . ."

Dane switched in his microphone. "We hear you. This is the *Endeavour*, Colonel Charles Dane commanding. We have just escaped your death trap satellite, as you probably know already."

"Yes, we did not expect that you would have the means to cut your way out . . ."

Dane felt a chill of rage. The person he was talking to must have been receiving the transmissions from the cameras aboard the satellite. "Sorry to disappoint you," he grated. "Nice idea of a welcoming party you people have. What happened to Earth during the last five hundred years—did the rats take over ?"

"It had to be done." The voice sounded tired and sick.

Thank heavens they are at least that human, thought Dane. "We're coming in to land. I'm putting the ship into the trajectory now," he bluffed, hoping for some rise from the unseen watcher.

The response was immediate. "No ! Please, for the sake of humanity, *you must not* !" The voice was pleading, panic stricken.

"We've given five years of our lives and lost all contact with our own age, for the sake of humanity," Dane said. "I lost one of my men inside that satellite—someone is going to pay for that."

"No, please!" begged the voice. "Do you think we wish to do this thing? You are already on our consciences—don't make it harder for us. If you attempt to land we shall be forced to kill you by direct physical action. Five hundred years of peaceful culture separate us from the violence of your own age; such things are indescribably horror to us. It would unbalance those who took part in it, beyond the salvation of our psychiatric techniques. . . ."

Dane was appalled at the incredible selfishness of the speaker's attitude. "That's too bad. You mean you don't mind us dying up here in your trap, but you wouldn't be happy if you had to kill us with your own lily-white hands?"

"No—you don't understand," sobbed the voice. "All over the planet our people are even now praying for your eternal souls."

"We're coming in to land!" spat Dane. "And we'll die fighting, if that's the way you want it."

"We have no *wish* to kill you. But there is no other way, please believe us. You are a reasonable man, Colonel Dane, we have preserved the records of yourself and your crew over the centuries. Hear us out, then make your decision."

Dane turned to the others. "Do we listen?"

"No! Tell them to go to hell!" screamed Lansing.

"Yes, let them explain, if they can," Bohr said.

Jameson nodded in his quiet way. "We *must* know."

"No! Don't listen. It's another trap!" Lansing lunged forward, his hands grabbing for the radio controls.

Jameson moved swiftly, pinioning the arms of the engineer behind him, and Bohr more ponderous lurched across and helped him to drag the struggling man away. The engineer kicked out frantically, spitting his rage.

"Carry on, Dane. We can handle him," said Bohr.

"Very well," Dane said, into the microphone. "We are waiting."

"Thank you," there was relief in the tone of the speaker. "It is best that you should know the whole truth, we see that now. To begin with—you are only half of Operation Star Chart."

"Yes—what happened to the *Astra*? Did you give her the same kind of welcome?"

"No! please . . . this is not pleasant for us. *Just listen* and you will understand. The *Astra* did not range as far as you, and she arrived back on Earth over a hundred years ago our time. She was met by the combined fleets and escorted down to a special berth at Earth Central. It was a great day in the history of mankind. All the leaders of our civilisation were waiting for her when she landed. Her crew were feted like heroes in every country of the globe . . .

"Then the pandemic started. All over the world people began to die like flies. Germ-borne diseases that had not existed on Earth for over two hundred and fifty years flared up overnight. Our medical science was powerless before the onslaught, totally unprepared. There was not just one plague, to which they might have found an answer, but a hundred different, horrible ways of dying, each of them just as certain.

"By the time we had realised the source of the infection it was too late. The members of the *Astra's* crew had brought back with them the diseases of their own age—ancient diseases long eradicated on Earth, for which our people no longer had the necessary resistance. Only a few people, in isolated places entirely out of physical contact with the rest of civilisation survived."

"My God!" Jameson's pale face was stricken. "The one thing none of us considered. Something similar happened when the Europeans first landed in America. The redskin population was decimated by a disease for which they had no anti-bodies—measles, a sickness that was a minor thing to the whites, but a fatal scourge to the Indians."

The voice from Earth continued. ". . . and so you see, a few survivors struggled back to rebuild some sort of a civilisation. A few hundred thousand of us in a world geared for billions. Space was no longer of any interest to us—except as the possible source of another scourge, which this time might wipe out the race entirely. There still remained throughout our renaissance, the threat that you of the *Endeavour* might return before we were ready for you.

"And so you built the satellites," Dane said dully. He was unable to make anything coherent of his emotions, a creeping numbness made him feel that death was already close. Could they demand their lives from the people of Earth and exact such a terrible price?

"Do you understand?" pleaded the voice. "I said earlier that you are already on our consciences. We realised the dreadful thing that we were doing—but surely the death of five men was not too high a penalty? The only alternative was the eradication of the human race from Earth forever..."

Dane heard a scuffling behind him and a scream of animal rage. He turned to see Jameson reel to the floor. Lansing had torn himself free and was bolting down the corridor.

Dane leapt out of his seat and followed. But Lansing, with the speed and power of his crazed mind, outstripped him easily and disappeared into the engine room, slamming the door behind him. Dane struggled ineffectually to open the door.

"Sorry about that, Dane." Bohr came puffing up behind him. "He was too quick for me."

Dane tried the heavy, radiation proof door again. "No good! He's locked himself in there. It's my fault—I should have known that he, of all people, would not be able to take this." He turned away. "Come on, there's nothing we can do here. We'll try and get him on the intercom from the control room."

The radio was blaring as they arrived back. Bohr bent over the prone form of Jameson. "Do what you can for him," Dane said.

"Are you receiving me? Colonel Dane!" the voice of the speaker was frantic with anxiety.

"He'll be all right in a minute," said Bohr, lifting Jameson to the acceleration couch.

"We hear you," Dane said into the mike.

"What are you going to do? We will do anything we can to help you—but you must not land on Earth!"

"I understand," Dane replied heavily. "But I must discuss this with the members of my crew. We will call you again in an hour."

"Thank you, Colonel. Our lives are in your hands. The people of Earth salute and thank you."

Dane felt himself flattened against the back of the seat as the ship suddenly surged with acceleration.

"Lansing!" Bohr said. "He must have started the engines. Can he control the ship from there?"

"He is maniac enough to try anything," gritted Dane. "Even a landing."

Jameson stirred and opened his eyes. Dane tried the controls, but they had no effect on the progress of the ship. He switched on the intercom and called the engine room. "Lansing! This is Dane, do you hear me?" There was no reply.

"He's pulling her alongside the satellite." Jameson rose unsteadily to his feet.

The ship decelerated now, then the engines ceased. Like a bad dream they watched the process all over again as the disembarkation tube snaked out and clamped to the side of the ship.

"Why? What the devil is he trying to do?" asked Bohr.

They heard a metallic sound from down the corridor. All three men rushed to the door and saw Lansing emerge from the engine room. He was wearing a space suit and in his right hand he carried a nucleonic torch. His eyes were flaring with a maniac fire in his blood-streaked face.

"Well, Colonel—what are your orders now?" the engineer's laugh was a rattling, diseased thing.

"Don't be a fool, Lansing. You'll kill us all!"

"Why not? We're dead men anyway," said the engineer. "But we can still take a few thousand of those mealy-mouthed swine down there to hell with us."

Dane edged forward cautiously.

"Don't try it Dane." Lansing waved the torch. "I'd just as soon burn you where you stand, but I'd rather you waited. You never thought much of me as an engineer, did you? Now's my chance to change your mind."

"What do you mean?" asked Dane, playing for time.

"That death trap out there." Lansing waved his free arm. "I'm going to dump it right in their laps. There's an efficient drive mechanism in the pile compartment—I'll orbit down, pick out their biggest city and blow it off the map."

Dane began to tense himself. Then Bohr's lumbering bulk moved suddenly past, thrusting him aside. Before another word could be spoken the big ecologist closed with the madman.

"Back!" screamed Lansing. He saw that his command was useless, and activated the nucleonic torch.

And Bohr was a great gob of flame, moving forward still under his indomitable will. The two men fell to the floor together, Lansing borne down by sheer weight of Bohr's body.

The torch flamed for a moment more, enveloping both bodies, then died.

A charred heap of human refuse lay stinking on the floor of the corridor.

"Poor devil," said Jameson softly. "The torch was never intended as a weapon."

Dane turned away sickly. The cloying odour of burning flesh seemed to fill the ship. Staggering, white with shock, he allowed Jameson to help him back to the control room.

There he sat for a long time, gazing brokenly at the view screen, whilst Jameson re-activated the engines and pulled the ship away from the satellite, working with a quiet, in-drawn concentration on his lean face.

"So this is the way it ends . . ." Dane stirred himself at last, some of the horror washing away from his mind, but only to be replaced by despair.

"No!" said Jameson strongly. His hands firm on the controls. "We can't land on Earth, but there is no need to wait out here to die."

"But what is left, Jamie?" Dane looked at his companion, then at the forward view screen where a billion stars burned diamond bright.

And he knew the answer. They had the ship, and food enough for at least another ten years . . .

Dan Morgan

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THE UNRELUCTANT TREAD

By Kenneth Bulmer

Uneasy truce smouldered between the three space empires of Takkat, Shurilala and Earth. Three young and vital cultures just beginning their outward plunge into interstellar space, they had first become aware of other races in their portion of the Galaxy with excitement and high hopes. That initial flush of dramatic joy and friendship had soon turned sour.

After a bad-tempered, horribly drawn out and pitifully useless war—three-sided, all ugly and hateful—they had at last, perforce, agreed on a system of strict military supervision of an armaments limitation treaty.

It had been the only way; any other course would have brought total ruin to all.

But everyone, every single person in three solar systems and their dependencies, knew that another war was inevitable.

Dropping in the picket boat onto the surface of the Moon, Charles Ward felt a prickling premonition that perhaps that

inevitable conflict was nearer than he or any of his navy friends had thought. To be summoned thus, straight from the successful completion of his lieutenant's course, by the high brass of the Space Navy must mean that Something Was U.P. Even though his father, old Admiral Jervis Ward, was a prominent member of that high brass, lowly second lieutenants were not ordinarily accorded the privilege of receiving their orders directly from Naval Planning.

He'd always had to play down the sometimes awkward family fact that his father was an admiral; some cadets had even thought it had something to do with his gay and airy passage through academy. Ward knew the answer to that—hard work and application, to subjects he loathed.

The pilot turned the boat over to automatics for the final run in and nodded towards the rounded back of the Interstellar Supervisory Board man, crouched over the auxiliary forward screen. The man was from Takkat, which meant that his personality was as sharp and edgy as the name of his race.

"Dunno which I'd welcome aboard least," the pilot said softly, his lips barely moving. "These hard fast guys from Takkat or those smooth oily devils from Shurilala."

Ward smiled back. "Wherever he comes from, he has a job to do. Probing into a barely civilisation's military installations must be a thankless task."

"Maybe. Every time I take one Moonside I get the cold shivers until he's safely landed."

"They're efficient. The Terran Space Navy can't instal an extra toilet into a Mark Three Cruiser without they want full drawings and specifications and have an observer on the spot to see the seat fitted." He laughed, lightly, his thoughts down there under the Moon's surface, in the office of Terran Galactic Planning, where his immediate future would shortly be revealed to him. "I suppose our men on their planets have an equally tough time."

The pilot nodded, turning back to his controls and preparing to cut automatics the moment they made moonfall. "I bet," he said, not thinking. "I bet."

After they had made the usual efficient Navy landing, Ward bade goodbye to the pilot, nodded curtly to the alien from Takkat, and walked briskly through air-conditioned and brilliantly-lit tunnels until he came to the reception desk for

Terran Galactic Planning. The girl in the Navy uniform was brisk, polite and with not a moment's glamour to waste on a mere lieutenant.

"Lieutenant Ward? Will you please go through to Captain, Plan? He's expecting you."

"Thank you," Ward said, and went on, wondering what in hell a green lieutenant had done to rate this sort of treatment. Captain, Plan, was big and beefy, with a wrinkled grin and deep-set eyes that automatically made Ward uncomfortable, reminding him forcibly of his own slight stature and indeterminate features. The handshake was short and powerful.

"Your father, Admiral Ward, would like a word with you, Lieutenant." The Captain looked thoughtful. Then he said, glancing at his wrist watch: "If you cut along to his office now, you can have fifteen minutes. Be back here then, sharp. Understood?"

"Understood, sir." Ward smiled perfunctorily, and followed directions to his father's office. He was not looking forward to this one little bit.

Trying to shake off his usual feeling of being a small boy, unceremoniously hauled before his father in the big mahogany and leather study at home, Ward knocked and went in. Admiral Jervis Ward pushed his massive body up from behind the desk, his face breaking into a pleased smile his great paw outstretched in a welcoming grasp. Ward saluted, feeling a fool, and then shook hands.

"Denvers, Captain, Plan, phoned you were coming along, Charles. Good to see you again."

"Thank you, sir. Good to be here."

"Hump." The Admiral sat down, grunting. He shot a keen look upwards at his son. Then he drew his brows down and said: "Know why you're here?"

"No, sir."

"Neither do I. Planning like to keep their little mysteries." He swung round in his chair. Ward recognised the signs. Another wiggling. His father said deliberately: "I received the report on your lieutenant's course, Charles. Damn bad show. You just scraped through. Bottom. Not good enough. You always seemed keen at academy." His voice softened into the paternal man-to-man air that always sent a crawling shiver up Ward's spine. "Well, old son, what went wrong, eh?"

"Nothing sir. I just didn't—that is—the subjects—" Ward faltered to a halt. He had always admired his crusty old father, rather as one might admire an ancient oil painting of forgotten glories. He found it impossible to put into words the admiral could understand his loathing for the military life, the strait-jacket of normal thinking imposed by navy discipline. Yet he knew that a link existed between them that would ensure that he would go on in the career chosen for him by his father, the career of a naval space officer. There was no other way out. Anything else would break up the old man, that was for sure.

"I must have been a bit off colour," he said desperately.

"Well," his father said, reverting to his normal staccato conversational style. "You should keep yourself fit, Charles. But the big thing is that you did get through. Now you'll be posted to a ship and begin to learn just what it takes to be a spaceman. Any preferences? I might be able to—"

"No." Ward almost snapped. He swallowed, and said: "No preferences, sir. I'll be happy to take any appointment Personnel see fit to give me."

"Ye-es, Personnel." Admiral Ward swung back to his desk and tapped a pencil absently. "Planning called you here, not me. I just took advantage of the fact. Why should Planning want to see you?" Then he chuckled at the realisation of the fatuity of the question. "Whatever it is, they know what they're doing."

"I expect so, sir."

"What's that?"

"I mean—everyone knows the war will break out again. Even though the treaty agreements are enforced, as strictly as they are, progress is being made in weapons and design; the brewing-up point will be reached one day."

"Charles, I want you to listen very carefully to me. I've been a failure—" he waved a hand, brushing aside Ward's involuntary and genuine protest—"Oh, yes, I am. I'm just a war-horse of an Admiral, sitting behind a desk in Moonbase. I think you'll do better than that. You've got the necessary ingredients in you; a touch of imagination, perhaps, that I never had. Comes from your mother, God bless her. But you can become a man who has done things that matter in space. There's no limit to what you can achieve in the Navy." His old eyes lit with anticipatory and vicarious pleasure, of

pride on his son. "You can become a very great naval officer, Charles."

Ward could find nothing to say.

The phone rang and the admiral grunted a few words, looked up, already smiling in farewell. "Denvers. Cut along now, Charles. And try to see me again before you blast-off."

"Very good, sir. I'll do that if I can."

As he reached the door, his father's heavy words halted him, one hand on the button.

"Remember always, Charles, to be efficient. There are not enough conscientious, efficient officers in the navy today. They're all slapdash, couldn't-care-less idiots who wreck a ship and walk away without a second thought." There was the sound of a sigh. "Earth needs all the good men she can muster for the coming struggle, Charles."

"Yes, father." And Ward went out. He took a deep breath in the corridor, straightened his shoulders, and marched smartly off to Terran Galactic Planning. He felt as hollow as a rubber ball.

He felt no better, when, at a brusque nod from the senior admiral he sat down facing the three men across the long table. There seemed to him something a little odd in the way this interview was being handled; he didn't know quite what he had expected, but this seemingly casual meeting between two admirals and a commodore and himself in a small comfortable room deep under the laval dust of the Moon created uneasiness and suspicion of self that, although quite familiar, he detested. Admiral Kutusov opened the bowling.

"Of course, lieutenant, you're wondering just why you were asked to come here and why we should bother to see you at all." His hooded eyes stared without winking at Ward, and his gnarled hands were quiet on the table top. "Before we answer your questions Commodore O'Reilly has a little background sketching to do." He stopped speaking with such abruptness that it was in itself a command to O'Reilly.

O'Reilly began as though discussing shop in the officers' club. "This truce between us and Takkat and Shurilala won't last much longer and when it blows up Earth has to be more advanced in technology and weaponry in all spatial matters than the others—more advanced than we are today.

But you know the impossibility of contravening the truce stipulations." His voice was bitter. "We cannot make a single move to improve our battleships, the alien Inspection Bureau is too close on our necks—but we know for certain that one of the other powers is doing just that!"

Ward repressed his exclamation of surprise and disbelief. If these men said that aliens were improving their weapons and spaceships, then the aliens were, Earth's Inspection Bureau or not.

O'Reilly went on: "So Earth must go ahead with research—our main problem is primary armament. The cannon we now use are about as good as the aliens'. We have every reason to believe that. But solid shot cannon are obsolete as far as one alien race is concerned. We know that they have developed a form of energy weapon, that is all."

"Not quite, commodore," put in the third admiral. "We also know that they have space-tested the thing. How they got it past our inspection men—and the other alien inspection teams—I don't know." He looked worried, and a nervous tic disfigured his cheek spasmodically. Admiral Kutusov glanced at him, then leant across.

"Don't take it too hard, Ben. It's done us a good turn."

Ward knew then that this was Admiral Ben McAllister, chief of Space Navy Intelligence. McAllister said: "I'll admit that. But it's not the way I like to operate."

Kutusov leaned back and stared thoughtfully at Ward.

"We are telling you these facts, lieutenant, facts which are not, quite obviously, general property, in a spirit of the utmost confidence. I don't think I have any need to go into details about discretion and security and your devotion to your race."

"No, sir." Ward licked his lips. He didn't like this at all. He wouldn't be told these inflammable facts if he wasn't slated for something highly unpleasant. His spirits dropped sickeningly. The aliens—at least, one race of them—manufacturing new weapons and space-testing them! And he, Muggins, looked as though he'd been picked to do something heroic and damned silly about it. Maybe he wouldn't live long enough even to start on that glorious career his father so much wanted for him. Kutusov was speaking again.

"Whatever may be the outcome of this talk, you will be given hypno treatment so that you may have no fear, now,

of hearing dangerous facts. "Your memory will be washed clean." His manner became more brisk. "Right now we want to give you some facts. Then we'd like your answer to the implied question. Right, go ahead."

Commodore O'Reilly took up the conversational thread, speaking again with that easy flow. "Facts are these, lieutenant. Knowing that the aliens possess this energy weapon and have space-tested it and thus by-passed both our and the other alien Supervisory Board people and their inspection bureaux, we have gone ahead with the design of our own weapons which we think is better than the enemy's. The problem with any weapon of this nature arises when we come to mass-production and installation, and before we can mass-produce, we must be sure we have a weapon that will, in fact, do in space what we, in theory, predict it will do. Follow?"

"Yes, sir."

"Good. Well, now, we must carry out space tests of this weapon aboard a fully operational battleship. No other lesser test will suffice."

Ward said slowly: "But you cannot install anything new aboard a battleship without giving notice to the alien Inspection people."

Admiral McAllister stood up jerkily and began to pace behind the table. Kutusov flicked an eyelid at him as he passed but the old admiral did not say anything. Quickly, and as quickly fading, Ward caught the idea that Kutusov had more problems on his plate than merely this one about space-testing a new weapon in defiance of the treaty obligations and under the noses of alien snoopers.

McAllister said: "We don't know how—they—did it. From our end, every ship of the navy is under surveillance, and any new equipment going down to the docks is inspected. We had to find a way of working on a ship without causing any snoopers to become interested."

Kutusov was staring unwinkingly at Ward. There was judgement and compassion and implacable decision in that basilisk stare. Then Kutusov smiled; it was like ice breaking up in the spring.

"Lieutenant Ward," he said, his voice barely audible. "We have discovered such a way. For a moment, put yourself in my position and try to arrive at a decision which takes into account the Galactic position and has no room at all for personal emotion. I will ask you a question. Remem-

bering that for these few moments you are Admiral Plan in Chief, tell me honestly what you would decide."

"Very good, sir," Ward said, and his mouth was suddenly and frighteningly dry.

Silence held, thinly, as in the period between the count of zero and the first lick of sound from the tubes. Then Kutusov lowered his heavy lids over his eyes, and, blindly, began to speak. It was obvious that every word hurt him.

"It is necessary, for the good of the Service and the good of Earth, that a young naval officer shall be assigned a task—for which, of course, he will volunteer—which may very well end in his death and will certainly mean disgrace and dismissal from the Service. In other words, you must select from the new list of second lieutenants one officer to sacrifice. Which, of them all, would you choose?"

Idiotically, Ward's first thoughts jumbled around his astronav figures. If he hadn't boomed so badly on that third problem, he'd have scored enough marks to put him one ahead of old Tubby—and if he'd done that, then old Tubby would be sitting here, instead of Charles Ward, and this hideous problem would have been Tubby's.

And then he thought of his father.

A sense of loss, of desolation overcame him. He felt soiled, unworthy; a useless scrap of humanity, whirled by cosmic forces along a golden path that he hadn't the vision or the courage to tread of his own volition. He felt like a swimmer, too tired to continue the fight against a hostile current, being suddenly flung by the disinterested might of the waves onto a saving spit of land.

And all the time there was this mental image of his father, standing on the rocky cliff, arms folded, regarding him with downdrawn brow, brooding.

Of course, his father, with all his navy traditions, would understand and sympathise and maintain that noble exterior—but, then, Ward would never be able to tell him the truth. It would be like cutting out his father's heart.

But, much worse than that, he would enjoy the doing of it. No—not quite that, perhaps. He would enjoy the freedom when it had been done.

Second Lieutenant Charles Ward, TSN, looked up at Admiral Kutusov. He said, simply: "I understand, sir, and of course I am volunteering."

Kutusov leaned back and for the first time Ward could plainly see the lines of weariness in that craggy face. He hated to ask what he had to ask ; but the pressures were building up inside him, he could not deny them utterance.

"Sir—may I have permission to explain to my father why—that is—that my disgrace or sacrifice or death is planned and not a result of inefficiency?" It sounded bald.

Slowly, Kutusov shook his head.

"That, as I think you must see, is entirely impossible."

Admiral McAllister—Intelligence—leaned across.

"Lieutenant Ward's father is Admiral Jervis Ward."

Kutusov twisted his lips. "I didn't know," he said, heavily. He put one veined hand to the back of his neck and massaged gently, his face, still with the shadow of what he had had to say etched upon it, bent forward and unhappy.

"I'm sorry, Ward. No-one, outside this room, must know what we plan until it is done. Afterwards—perhaps."

"I understand, sir."

Ward spoke clearly now, hating the passionate joy that flowed through him ; the tearing sorrow for his father there still but alleviated partially by the knowledge that nothing he could now do could prevent what must be. But if only he had had the courage to refuse Kutusov's dictates. If only he could have said : "I know I passed through the course with lowest marks and have proved myself a not-very-good officer ; but because of my father's wishes I must continue my career in the space navy !"

If only he'd had the guts to say that !

But, as he well knew, a man will find many excuses for doing what he wants to do. If it hadn't been this chance to serve Earth legitimately and get out of the space navy, then there would have come a day when he'd have opted out, ignobly. When one was as deeply committed as he was, the outward shows and symbols of loyalty meant nothing ; that the public mind would connect him with whatever disgrace the admirals had thought up didn't matter—he would know that he had not failed Earth. And knowing a thing is what matters—the rest of the Galaxy could go hang.

Which brought him squarely back to his father and his father's grief.

A bustle and stir in the room penetrated Ward's sombre thoughts. Papers were being assembled on the table and

Kutusov was lumbering heavily to his feet. He turned that massive head with its hooded eyes upon Ward.

"You are being appointed in command of a destroyer, Ward. We'll let you settle down in her for exactly one week. Then Commodore O'Reilly will be having a word with you. I think that's all. Goodbye. And thank you." He held out his hand.

As Ward took it he realised that the admiral had omitted the traditional 'good luck' from his salutation.

Although knowing, now, that he would have to bear it for only about a week longer, Ward was deeply irked by his comrades' laughing comments on his appointment to command a destroyer. It was not an out of the way appointment for a young officer, even one just passed through lieutenants' course. Ward was quite capable of handling a ship, and two or three others of his comrades had achieved the same distinction. But he could not fail to notice the almost insolent familiarity of all aboard his new ship when he boarded her for the first time in her berth built in the artificial extension of Deimos.

Simpson, his exec, was actually senior to him. That made life almost unbearable. But for the secret knowledge in Ward, he would inevitably have been forced to resign his command. The only bright spot was that Simpson, too, was a little on the dim side. The two of them became known as the 'Dumb-bell Twins' in the Two Hundred and Fifteenth Destroyer Flotilla, based on Deimos. Ward ignored it all, tried to learn the inside of his ship, and waited impatiently for the call from O'Reilly.

When it came there had been a minor accident aboard D.9764. Destroyers were charged with the task of bedevilling the battleships, of darting in, launching torpedoes, and fleeing before their retribution could overtake them. D.9764 was an ordinary enough destroyer, and, in other circumstances, Ward would have been bursting with pride in his ship. Now, when Simpson reported that number two torpedo hatch had sprung, he merely nodded, and said: "Get it seen to, then, Simpson. I have to go ashore."

He changed into civilian dress in the officers' club and then caught a shuttle to Mars. The atmosphere plant had created a pleasant blanket of air over the Martian surface. Men had come here and given the planet back its youth. Old Mars

was now a green and fertile world again, tinkling with silver streams, rustling in green and verdent dress, coyly sheltering behind fleecy clouds.

Slanting in towards the spaceport just outside Galileiville, with the rounded bulk of the horizon's rim hiding the old but still raw scars of the three hydrogen bombs the aliens from Takkat had managed to slide through the defences, Ward felt a great need for creative work within him. This bringing to a new life of old planets was the sort of work he knew he would be happy doing. It held promise of great and glorious victories over the dark and death of space far greater than any that could come from fighting and slaughter with other men, though aliens they might be called, in the deeps out there beyond the stars.

He disembarked with a little sigh. After he had received his orders from O'Reilly, he might in a few days be dead, buried with all his dreams and aspirations unfulfilled.

Galileiville was a gay and pleasant town, with wide parkways and tall graceful buildings. Ward met O'Reilly also in civilian clothes, at the small bar designated. The scented air was very pleasant, as was the tall, frosted drink.

O'Reilly wasted no time. He gave Ward his orders, briefly, brutally, pungently. Ward heard what the man had to say in silence.

Then he drank deeply and tossed the glass over his shoulder. "To my own damnation!" he said.

The glass, being plastic, did not break and a robot waiter scurried to retrieve it and replace it with another. Ward laughed bitterly.

"Even a farewell gesture is denied me."

"Come and see me when it's done," O'Reilly said. "You'll be due for leave anyway, pending the court-martial. We'll arrange your future then."

"If I'm still alive," Ward said, and still could not really believe what he had heard or was saying. He went back to D.9764 in a daze which changed to gusting raw anger as Simpson met him with a tale of failure.

"Listen, Mister Simpson," Ward said quietly. "I want the ship ready to space within twelve hours, understand? We blast off with the rest of the flotilla for the fleet manoeuvres. And no excuses for failure will be accepted."

"But the torpedo hatch—"

"To hell with the torpedo hatch ! You'll fix it ! You're an officer of the Terran Space Navy. To you, as to me, there is no such word as impossible."

Simpson walked away, his back very stiff. Ward was glad he could not see his exec's face.

And, in due time, D.9764 did blast off with the rest of the flotilla, to join the Training Fleet and begin their journey out beyond the orbit of Pluto. There they would carry out practice interception defence attacks, simulating the defending forces whilst the Outer Orbit Fleet tried to slip attacking ships through the defensive screen. It was to be all very lifelike and real, warlike in as many details as possible. And, for the task assigned to Ward, that very reality was the cloak for his activities ; anything less, any suspicion that what he was about to do was a put-up job, would wreck everything and at once bring the Supervisory Board people down, breathing fire and slaughter.

Once beyond Pluto's orbit—Pluto itself was away on the far side of the System—the Fleet took up its defensive positions.

D.9764, with two other destroyers, was assigned the job of close coverage to a late type battleship, a huge leviathan swimming in space, bulging with menace, a powerhouse of energy and an arsenal of destruction. Ward spent a considerable time at the side screens, studying *Hindustan*, noticing how her bulging flanks curved around the cannon turrets and her atomic-drive tubes, grouped at bow and stern and in steering nacelles, presented a difficult target to any torpedo officer—alien or Terran.

It must, decided Ward, be done without hurry, without panicky urgency. As O'Reilly had said, the slightest bungling would not alter in any way Ward's own disgrace ; but it would nullify completely the whole object of the scheme. A single sour note, and the Inspectors, hard-eyed men from Takkat and Shurilala, would swarm out to probe and pry and prevent what old Admiral Kutusov so dearly wished to do.

"Message for the Captain."

Ward turned and took the message form from the yeoman. He noted with amusement that it was unrestricted, and routine. Then he read it.

"Replacement parts spaceborne and awaiting your delivery instructions."

"Acknowledge," he said briefly, and turned back once more to regard the bloated shape of *Hindustan*.

Let the aliens get what bones they could from that perfectly innocuous message.

Thirteen hours after that, with Simpson on watch—the normal destroyer complement was small—the first alerts of approaching ships came in. The Outer Orbit Fleet was sending in its scouts. Ward watched the battle develop on his celestial globe, slave to the big globe aboard the flagship, and carefully watched the approach of the heavy enemy units. If this had been a shooting war, flame would already be roiling out there in the depths.

As he had expected, the big enemy units bored in through the channel carved by their light elements. Umpires out there were sending the 'You're dead' call to ship after ship as the fleets clashed.

Dummy torpedoes sped across space, to be caught and cushioned as their plastic gas-filled shapes split and died against the metal flanks of battleships. Had those been genuine torpedoes—those same metal flanks would have caved in and crumpled under the blows. Ward went down to the torpedo flat.

The practice torpedoes, distinguishable from their armed and deadly brethren only by their bright yellow paint, were ranked ready for continuous insertion in the tubes. Ward easily repressed the thumping of his heart as he idly touched with his toe the yellow torpedo that he, personally, had seen brought inboard and stowed with the others. Painted yellow, a wolf in sheep's clothing, it lay there, quiescent, spelling his own court-martial and disgrace. He could feel nothing now. He was committed.

The oncoming battleships grew. Destroyers of the enemy force sped like foam on a breaking wave before them. D.9764 with her two consorts moved out to intercept.

What should have been a carefully executed plan erupted in his face with inefficiency, slackness and the general low-level of training aboard his ship. As the enemy ships flashed towards them, his two consorts opened fire. Umpires aboard ceaselessly roaming observer ships watched everything; and Ward knew that aboard those ships, also, were aliens of Takkat and Shurilala.

The mock battle swung towards them. *Hindustan* opened fire. Destroyers received the 'You're dead' call and fell out

of line. Heat began to mount in the control room and the drone of machinery knifed into his brain.

His torpedo crews were now entering the fray, following their shipmates in the gun turrets. Torpedo after torpedo flashed away, to strike or to miss. Carefully, Ward counted the shots. Three to go. He eyed furtively the man at the control board, sitting tensely and unrelaxed. Poor concentration; like the rest of the crew of D.9764, of poor quality. O'Reilly knew what he had been at when he'd selected this ship for Ward to command. Two to go.

He ordered a slight course correction. The helmsman's reactions were slow; slow enough for Ward to feel perfectly entitled to say brusquely: "All right. I'll take over here."

"Aye, aye, sir," the man said, not reluctant to be relieved of duty in this moment of many pressures.

Ward took his place, watching the tell-tales, waiting for his moment of destiny. One to go.

Up ahead he could see on his forward screens the dots of enemy battleships. Off the screen, but inching onto his port and lower screens was the bulk of *Hindustan*. Ward rolled D.9764 a trifle, firing his laterals with delicate precision. If ever he had been a good navyman, now was his chance to prove it. He watched the sighting lines until they levelled up on the line of flight of *Hindustan*, a quadrant ahead. The last torpedo left its tube; the tell-tale lit and Ward knew that this was it.

Almost casually, he fired his starboard jets, brought D. 9764's head round, watched the firing lines converge directly upon the second midship turret black against the sheen of *Hindustan's* flank. Just there, where O'Reilly had shown him on the photographs. A real torpedo—and God help the men aboard.

His mind was not prepared for the explosion which crashed below. D.9764 shook. Lights flickered and went dim. Rubber began burning. Men shouted and there came the hissing of the fire appliances automatically brought into action.

Simpson came shouting, his face black with smoke.

"Torpedo hatch blew out, sir! All the crew went with it. Fires all over the place—"

The man was plainly hysterical. Ward stood up. He had not thought, yet, what his failure meant.

"Did the last torpedo fire—?" he asked. But he knew that answer from the dead tell-tale. "All right, Mister

Simpson ! Get below ! Assess damage and report ! And keep the panic to yourself—don't contaminate the men !”

Simpson straightened as though slapped round the face.

“You can't talk to me—”

“That's better ! A little spirit !” Ward spoke viciously, letting his anger and frustration spill out. “I'm tired of your inefficiency, Mister Simpson. It's your fault the hatch blew. Now get down there and put things right.”

Simpson shut his mouth, opened it, swallowed, and said, in a surprised voice : “Aye, aye, sir.” He went at the run.

Ward swung back to his control board. Without taking his eyes away from its story, he said to the helmsman : “Get along aft, too. You can help there. Move !”

“Aye, aye, sir.” The man went out.

Ward looked up and glared round the control room. “All unessential personnel—you, you and you—get below. You're needed there. Move !”

The control room cleared. Ward slumped down in the pilot chair and brought his screens back to order. There was still power, and the electronics of the rocket drives were still functioning. He made his decision almost without being aware that a decision had been reached. A court-martial was just that ; for whatever you'd done.

He began to roll D.9764 again, angling her away from the flight path, pulling her free of the flight pattern.

Hindustan grew shockingly on his forward screens.

“So I'm a no-good navyman, am I ?” he said through bitter lips. “Can't do anything I'm ordered to without making a mess of it, eh ? Well, we'll see. We'll see.”

Hindustan filled the screens.

“Always fluff the big jobs, eh ? Inefficient, slack, slap-dash, eh ? All right, father, you'll see just how careless I am. It's not everyone who throws navy ships about like stones.”

Ahead now there was only the vast and gleaming bulk of the battleship. Her turrets and ports caught light, picked out in black etched shadows the light from her own tubes and guns and D.9764's tubes. Ward thrust over the full acceleration buttons savagely, hammering them home. He set the crash alarms wailing throughout the destroyer. He felt choked, scarcely able to breathe. He ripped his uniform collar open and heard, through the uproar, the tinkle of his

insignia as they hit the deck. "Symbolic," he said, shortly, and took a last look at the screens.

"If a torpedo would do the damage, then a destroyer ought to make an even better job!"

And the slim destroyer bit into the flank of the battleship, pierced it like an arrow, smashed and splintered that armoured side as she herself crumpled in utter destruction.

All Ward saw of that was a sledgehammer flare of light that seemed to tear his head from his shoulders.

And the blackness.

He did not, at first, believe he was alive when he recovered consciousness. His gradual and painful groping back towards full health and full command of his shattered body took months of patient waiting. Lying there, in the cool white hospital, he had a long time to think.

Thinking, like mending his body, at first took effort and concentration. But later, when he saw things more clearly, it became easier.

The reports were not pretty.

'Fatal accident on ship manoeuvres.'

That was a mild one. Most of the press and radio coverage had an ugly tone; they wanted his blood.

Destroyer rams battleship. Young officer's fatal mistake.

So they'd prejudged him, before the court-martial. He supposed he could sue; but that mattered little now. He was trying to feel his way through his feelings. Freedom from the Navy. Tell his father the truth; then get out, away to some raw frontier planet and start a new life doing something useful. But a picture of those hydrogen bomb scars on the fair face of Mars kept obtruding itself.

The court-martial dragged through, in camera, in space and with publicity held at a minimum. But they pillorised him all the same. He read the words afterwards, and felt his stomach curl as though he had drunk acid. The press and radio boys knew when the public wanted a sacrifice.

When it was all over and he was Mr. Ward, civilian, he did what he had to do, using his mother's maiden name and finding it ridiculously easy to pass the requirements, and then went along to see his father.

Admiral Jervis Ward sat, shrunken and frail, in his big leather chair in that familiar leather and mahogany study on Earth. Yet, now, Ward felt no small-boy feelings of guilt

and apprehension. He went in and began speaking at once, not letting his father say something for which later he might be sorry.

When he had explained that the accident was a deliberate order carried out, his father interrupted. "So they chose you for this because you were the worst officer in the latest batch ; they could spare you most easily !" He leaned back with a little gasp. "What an honour !"

"That's how I couldn't feel—someone had to do it. It was a job for Earth, no matter why or who was doing it."

The admiral nodded, slowly, reluctantly. "Yes, I see that, I suppose. But it still hurts. My boy—tell me, why did they have to go to all this trouble ? Surely if they wanted to wreck a ship they could have dropped one a little heavily in dock, or something like that—"

Ward shook his head. "It had to be done in space. The new energy weapon—throws huge goutts of primal energy I believe—was sent up in a small civilian freighter and transhipped en-route. They had intended that my torpedo would tear a hole in *Hindustan's* side and during the repair, they would substitute the energy weapon for the turret guns. The aliens passed it by—the accident, I mean—as a normal collision and the repair crews worked in space patching up the battleship. The energy weapon went in." He smiled tiredly. "I hear it is very successful. This coming war might not go so hard for us, now we can put the new weapon into production, knowing that it really does work under active service conditions."

"And they sacrificed your career for that."

"You must know I didn't want anything of the navy—you must have realised that I wanted to do other things."

"I suppose so, lad, I suppose so. But when you've set your heart on a thing, all your life, working and praying that your son will make a better man at your job than you were—it comes hard when he decides to do something else. It comes very hard."

Ward swallowed. He realised he could say something fatuous, like : 'Life must go on,' but that wouldn't help his father now. Not very much could help the old boy now. Oh, sure, what he had just done, using his mother's maiden name of Vickers, meant a new start for him personally ; it still wasn't what his father had wanted.

But, in any life, you can't please everyone. You just have to do what you think is right—and hope that other people will see and recognise that. His father gripped the arms of his chair and stood up heavily. The room, which had been in near darkness when Ward entered was now totally lightless except for the thin slit under the door, and so Admiral Ward pressed the lighting button. They both blinked in the sudden illumination.

Knuckling his eyes, Admiral Ward said: "I can guess what you'll be doing, Charles. Going off to the wild frontier to tame new planets. Well, that's worthwhile, I suppose. Although plenty of men can do that; not many are good space navy men." He blinked and opened his eyes, looked straight at Ward.

Ward opened his overcoat and let it drop to the floor. He shook his head.

"No, father," he said softly. "Some things are in a man's blood, whether he wants them there or not. You can see that—as you can see this uniform—quite clearly when you try to look."

Admiral Ward did not speak for a full minute, staring at his son's brand-new space navy uniform, without badge of rank or sign of long-service, with the little round crewman's cap pushed to the back of his head, contravening all regulations

"So you enlisted," the admiral said.

"Spaceman, Fourth Class, Vickers, reporting, sir."

"I see. Very well, spaceman Vickers. You have a lot to learn about the space navy." The old man's voice suddenly boomed. "Get that hat straight on your head, spaceman!" His old creased face was bright with something that for the very first time touched Ward with meaning.

"Yes," Admiral Jervis Ward said happily. "Yes, you have a lot to learn, Spaceman Fourth Class Vickers. But you'll learn—by God, you'll learn."

Kenneth Bulmer

From time to time we have published articles concerning the latest developments in computer design and activation. This month Kenneth Johns discusses the most recently developed of such components—the cryotron.

KEEP A COOL BRAIN

By Kenneth Johns

Floor space the size of an airship hangar covered with busily humming computer units looks impressive. But in this rapidly advancing nuclear age it is out of date, as digital computers go, on two counts.

The two drawbacks to the large-scale use of digital computers as robot brains are size and cost, and of these the first is the more important.

You can't send a robot brain reduced even to the size of a house up in a rocket. And the spaceships that are just over the horizon will require robot brains that are swift, infallible and long on memory—and they will want those brains packaged into the smallest possible space and of the lightest possible weight.

So far, various stages of miniaturisation have reduced the size of computers from massive bulks occupying several rooms down to a couple of deskfuls of electronic components. Sub-miniaturisation has been achieved mainly by the use of more and more compact memory units and the replacement of thermionic valves by transistors.

Smallness also carries another advantage which at first sight appears redundant, but which has a very positive value. The speed of light is the limiting factor in the speed of operation and therefore any reduction in the distances to be travelled by the electric currents carrying the signal impulses materially increases computer efficiency.

Now comes the latest component for electronic computers which promises to revolutionise their design. Like many other technical achievements, it makes use of a principle which has been known for a number of years and which has had to wait until the right moment in time before it could be put to practical use. This new device promises to do away with problems of size and weight and opens the way for complex digital computers to be built into aircraft, test rockets, guided missiles and artificial satellites—and in the spaceships to come.

The device is the cryotron.

It is merely an insulated niobium wire .003 inches in diameter wound around a .009 inch thick tantalum wire. They are tiny; their smallness may be judged by the ease with which one hundred fit neatly inside a thimble. But each one can be used as an electronic switch.

There is—not so much a snag—as a trick of science to be played before they operate. They must be immersed in liquid helium before they will work.

The advantages of using the cryotron are so great that the continuous cycling of liquid helium is a minor detail—the sort of occupational demand that is met as a matter of course and one which should not present too many problems with the modern methods of liquifying and storing liquid helium.

The reason for the liquid helium is the temperature levels on which the cryotron works. And this brings in the strange phenomenon of superconductivity. Superconductivity was discovered fifty-six years ago but has had to wait until now before finding an important practical application.

Some metals and compounds become perfect conductors of electricity when cooled near to absolute zero. The point here is that these cooled metals do not become just good, or very good, conductors; they are *perfect* conductors. A current of about 200 amperes was electromagnetically induced in a ring of lead kept at seven degrees above zero. The

current circled endlessly around the ring. Two years later the current was found to be of exactly the same amperage as when the experiment was begun.

Quite a large number of compounds and alloys and twenty-one elements are known to possess superconductivity near absolute zero.

The cryotron depends upon the fact that the transition from conducting to superconducting occurs quite sharply and is influenced by a magnetic field. Keep a piece of tantalum at 4.2 degrees above the zero—the boiling point of liquid helium at atmospheric pressure—and it is 0.2 degrees below the transition temperature. Now pass an electric current through the niobium coil—itsself superconducting so there is no heat produced—and the magnetic field brings the tantalum back to a normal conductor with a consequently high resistance.

Thus the cryotron operates as an on-off switch.

A digital computer can now, therefore, be constructed of very small size and the next question is that of power. One million cryotrons require as much power as a 100 watt electric light bulb and may be run without any complex power units—even a simple battery is sufficient. Pack these miracle midgets in tightly and a standard size computer can be built in half a cubic foot of space. For continuous operation a fairly elaborate refrigeration system is necessary to liquify the helium as it boils off, but an expendable or lightweight computer may merely be fitted with a liquid nitrogen cooled store of half a cubic foot of liquid helium—enough for one day's operation.

So, for the expenditure of just over a cubic foot of space, we can put a first class computer into a plane or rocket. Feed it with pre-flight data and connect to the sensory and monitoring instruments and it will very nearly think for itself. Certainly it can cope with more situations and problems than half a ton of standard gargantuan guidance equipment, safety gadgets and monitory apparatus.

Up to now the cryotron's speed is not too good due to the inductive effect of the relatively thick tantalum wire; but this will undoubtedly be overcome by plating a very thin layer of metal on a non-conducting fibre.

It is beginning to look as though the first space travel, and the subsequent exploration for a number of years, will be

carried out solely by robots. Almost, it seems, science is going to put space pilots on the unemployed list.

With the known limitations on weight that can be lifted into space by current rocket techniques, it seems pointless to send up a hundredweight of human being with a couple of tons of allied equipment designed to secure his survival when a mere hundredweight of cryotron-based computer can perform his job more accurately, with small delay times and with an infallible memory. And why tie spaceships down to the 8-g or so bearable by the human frame when equipment can be built to withstand 20-g?

Judged by present missile performance the only thing that stands between Man and space is Man himself.

The cryotron-based computer may well bring forward the successful conquest of space and it will then be ironical if the first ships to the Moon and to the planets beyond carry only robot crews. Because of advanced technology, we may at first have only a second-hand view of the worlds of wonder beyond the Earth.

Although—judging by our increasing dependence on TV and its predigested reels of second-hand experience, robot explorers will not just be ironical—they will be part and parcel of the new age.

Kenneth Johns

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So far, Robert Presslie has been making a name for himself in our companion magazine Science Fantasy, but his main ambition has been to appear in New Worlds. He makes his debut here with a neat little story of the trials of a Martian colony.

THE 40th OF DECEMBER

By Robert Presslie

The excitement ran high, like picnic day at an orphanage. It was disgraceful to see grown men jittering about like kids. For any men it was unseemly conduct. For trained scientists and technicians who were also tough as teak to start with and tougher still after six years on Mars, it was incredible.

But it was the day of the coming of the women and that single fact made everything they did understandable.

With one exception, every man had shaved off his beard. Shaving took up too much time and trouble, that had been the general excuse. Suddenly it was a ritual that must be gone through with the utmost care. And amateur barbers did a roaring trade with the crudest of instruments and the minimum of experience in trimming shaggy hair-styles into some semblance of neatness.

Burge was the exception, naturally. It was not fitting for the base commander to appear in any way perturbed just because the Beehive was completed and the first batch of women settlers was due. Burge had never been a frivolous man and the responsibility of bossing the project had made him more serious and solemn than ever.

Yet Ferguson noticed that while the beard was still present there was a certain order about it which had not been previously conspicuous. And although Ferguson had risen to be second-in-command he had retained sufficient camaraderie to be able to laugh with the others about Burge's beard.

They had never had a whole day to themselves before; it had been six years of unremitting toil with only brief hours of rest. They did not know what to do with their unaccustomed leisure. They were in and out the cells of the Beehive dozens of times, staring into the empty sky, seeking the incoming ship—a ridiculous action, since the time of arrival was known to the minute and the radar screens would see the ship long before human eyes would.

Then in the late afternoon when the ship touched down, they fled inside and did not come out again until they had preened and primped.

Protocol and pride tied them to the site while Burge went out to the ship in the turbo-sleigh. They watched enviously as he climbed into the ship.

Burge too had greedy eyes but they were for the ship, not for its cargo. He walked with pussy-footing steps as if his boots might soil the decks. He found it impossible not to touch the walls and the controls. He nodded knowingly at the dials as if he knew all about them, when he was acutely conscious that he could no more fly this ship than fly without it.

The pilot let him fill his eyes before introducing himself. He said his name was Leeds. He added, "Anybody would think you had never seen a spaceship before."

"Not one like this," Burge said admiringly. "The monsters we've had until now were ugly things."

Leeds was as proud as Burge was envious. "Planet-to-planet job, this one. That's why they went back to the old cigar shape." He went into technical details about the automatic wings which sprouted progressively as the ship entered atmosphere; only inches wide at first entry, then full swallow-spread for the skid landing.

"And," Leeds said, "I don't have to wait for the planets to be in position for a minimum fuel transit. She's got so much power I can come and go when I please." —

He gave Burge a solemn look. "Or when the ladies please," he added.

"What have they got to do with it?"

"Everything. For once somebody has a return ticket. If the ladies don't like it here they can opt for home again."

"That's a fine way to start a settlement!" Burge complained. "We're not exactly equipped with all mod. con. out here and if incomers—be they men or women—know they can leave if they're not satisfied, well, I ask you!"

Leeds shrugged. "It's none of my business but I think you should remember they *are* women. And the future of the settlement depends on the reactions of this half-dozen. If I know anything about the selectors, they probably gave them this option more as a safety-valve than anything else. However, they're your problem now."

"You sound glad to be shot of them—"

"No, I didn't mean that. But I've got my job and you've got yours. I simply meant they're off my hands now. They're not a bad bunch."

"What's keeping them?"

"Burge, you don't know very much about ladies. Even if they are going to come out in space-sacks and helmets, they still must powder their noses first."

The base commander sighed and muttered darkly. Leeds did not catch what he said but handed him a sheaf of papers. "You had better read these, I think."

Burge flipped through them quickly. The perfunctory examination was enough to reveal a few facts which surprised him. Three of the women were Irish, the other three were Spanish. Only one of them was under twenty-five years old. They did not have a degree or a diploma between them. Burge tossed the papers aside.

"Six extra mouths to feed and not a stroke of work in return," he grumbled. "They must think I'm running a holiday camp."

The intercom door opened and the women filed in. Except for their helmets, which they carried, they were dressed for outside. The first one to reach Burge was very tall. She managed a certain elegance in her walk in spite of the heavy boots. She had a cold hard face that testified to well over thirty summers.

"We think nothing of the sort," she addressed Burge. "In the first place, if you have any grouse it should be against the selectors, not us. And in the second place, if you gave

the matter any thought you would realise that our mission is to become wives, not extra hands. I believe the choice of candidates was thoroughly thrashed out. There were some like you who thought the first women should be scientists. The others won; they maintained that the men needed a complete break from their work in what spare time they had. We may be useless from your point of view, Mister Burge, but we intend to make damn good wives for somebody.

It was a bad start and the wrong way to tackle Burge. He was no tyrant and would willingly change a decision after reasonable discussion but he would not tolerate any suggestion of being dictated to.

"What's your name?" he snapped, picking up the papers again.

"Jones. Vera Jones. Nationality Spanish-American. Age thirty-four. Weight one hundred twenty pounds. Occupation nil. Anything else?"

Burge moved a finger down the list of names. He looked up sharply. "There's a Verna Jose here—is that you?"

She bowed slightly. "I switched the N around. The name you've been given has connections which I left behind on Earth. I hope it will remain that way."

Burge was not vindictive. "You're starting a new life," he said. "If you want to start with a new name that's your business."

"Thank you."

"I wasn't finished. I was going to say that it should be very easy to forget any past out here. As I was telling your pilot, we are not in a position to offer all the usual amenities. We've finished the Beehive to the extent that the perimeter of cells is completed. But the work that remains to be done is a lot more than what we have accomplished. There are pylons to be erected to take the sections of the dome and until the settlement is domed over it consists only of a number of separate cells. Until then, there can't be linking corridors or—"

Vera Jones cut in. "You can't frighten us. We knew all this before leaving home."

"Perhaps," said Burge. "But I was trying to explain why I think they have sent the wrong type of woman. We need people who can work."

Leeds had something to say on that point. "They're coming next month—another dozen men. And a dozen every

month or so after that, just as fast as the selection board can find them. We've got four ships like this one on the stocks."

If the information was supposed to placate Burge it failed. Its effect was exactly the opposite.

"Another twelve!" he said. "They should send a marriage counsellor and be done with it. Don't they think I've got a big enough headache allocating six women among eighty-four men without sending more?"

Vera Jones grinned gleefully. "That's one headache you don't have, Mister Burge. You don't have to decide which six men are most eligible and most deserving of wives. The instructions say we do the picking. It's all in the papers."

Burge would never have admitted it but he was glad to be shot of a problem which had bothered him since the first news of the coming of the women. He had given many private hours of thought to it; wondering whether to allocate the women to the six oldest men, or the youngest, to the best workers or to the ones who could be spared most. His tentative conclusion had been to choose the men with the longest record of service but he had seen that whatever his decision it could lead to bad feeling.

Without shirking his responsibilities, he would have been the first to admit that he did no more for the women than was absolutely necessary. He saw them housed in cells, two to a cell for company, he made sure they knew how to work the air intake valves, warned them about wandering out of sight of the camp and of the dangers of sudden sandstorms; then he pretended to forget them and carried on the routine work as before.

The fact that he had not forgotten them showed. He discouraged radio chit-chat on the work-site, maintaining that it interfered with the issue and reception of orders. He castigated anyone whose work was the slightest bit sub-standard and told him to keep his mind on the job.

And he scowled at Leeds' ship every time it caught his eye. He thought it was a colossal extravagance to keep it waiting there for three months while the women made up their minds about staying on Mars. He refused to see that it was more reasonable than having Leeds go back to Earth and returning if required.

He tackled Leeds once. "If they decide to go home why can't they use one of the ships that will be bringing out new recruits?"

"—and have me travel without freight?"

"It comes to the same thing," Burge argued. "If you take them, the other ships will go back empty."

They were in Leeds' ship at the time. The pilot scratched his head. "You're an awkward something. I suppose I'll have to tell you."

"Tell me what?"

"You're all going home." Burge's face fell open and Leeds went on: "This is unofficial. For all I know it could be nothing more than rumour. But the way I heard it there's a dozen of you people going back for every dozen that comes out—until the entire staff has been switched. They think six years is as much as any man can take."

"Flaming nonsense! We could stay here indefinitely."

Leeds stuck out his bottom lip. "Don't shoot me. I'm only telling you what I heard. Besides you might be one of the six that doesn't go home."

Burge pricked his ears. And having committed himself thus far, Leeds decided he might as well go the whole hog. He told Burge, "The six that remain on Mars will be the six the women choose—if they choose any. The psychos believe that having a wife will give them steadiness, remove all the subconscious fears and frustrations that make a man need Earth whether he realises it or not."

Curiosity and wonder carried the women through the first week of their visit. In the second week they were still meeting new faces, since there was no place large enough for a communal meeting and they had to visit the mens' cells in rotation. By the third week they were beginning to have grievances, which they stuck with for another week before sending a delegate to Burge.

Vera Jones was the delegate. She could have picked a more auspicious moment. Burge had just received official confirmation of Leeds' news and was fuming after discovering that he too would eventually be replaced.

"What do you want?" he asked, without any pretence at politeness.

"Not you," she parried. "Although it occurs to me now that you're the only one the girls haven't been to see. All the others have had a turn."

"There is nothing I would want to see them about."

"You could be wrong, Burge." She had dropped the taunting *Mister*. "I think it wouldn't be a bad idea if you did see them—en masse of course; they're too scared of you to consent to individual meetings."

"But you're not scared—naturally."

Her face went hard. "Why naturally? I quite realise the men circulate stories that I am cheap in a high-priced sort of way but I thought you were above listening to that kind of gossip."

Burge was genuinely surprised. "I didn't know about that," he said. "I meant you were obviously not afraid of me because here you are. And I expect the talk is pretty innocuous—probably stems from your past. It isn't every day we get a visit from an actress with two divorces to her credit. I'll see that the gossip is stopped."

"Don't bother. It doesn't annoy me and it isn't important. The important thing right now is that the girls are getting restive."

"What about?"

"Two items. One—how can they get to know the men well enough to choose a partner when there are over eighty to visit? They can only manage a couple of hours with one man, then it's somebody else's turn. Secondly, they need something to do. The men have their work all day, the women have nothing."

Burge tapped his table-cum-desk. He said, "That wouldn't have happened if they had been trained for our kind of work."

She conceded the point. "Maybe you were right, maybe not. But what are you going to do about it? If you don't do something they'll be packing their bags for home soon."

Burge remembered the official message. Not being a devious cunning man, it was only then that he realised he had one insurance against being posted back to Earth. All he needed was a wife.

"I'll tell you what I'll do," he said. "I'll have the connecting walls of five cells taken down to make a small assembly hall. I've thought for some time that the men needed a place where they could get together—this should please the women too. I'll put a detail on it tomorrow."

Vera Jones noticed the change of tone and wondered what had caused it. She said, "Thank you. And if you give us the job of dressing the place up we'll be more grateful still."

"Why not?" Burge said. "And you can ask me along some night to meet the other women." He smiled and added, "En masse of course."

But when he got the invitation the first contingent of replacements arrived from Earth the same day and he had to pass it up. Instead of meeting Rose and Rosa, Mary and the two Teresas who were distinguished from each other by the prefix of Irish or Spanish, he met a dozen eager beavers who wanted to know all about Mars in one brief session and who did not realise that the man they were questioning had to fight hard not to hate them for coming to take over.

Then he had twelve men to select for repatriation and forms to fill in for their transfer. He had to see the new men paired off in cells with suitable companions, make sure they got their booster shots and fill in more forms. In all another week passed before he even thought of the women again.

He found the assembly hall functioning as he had intended. A quiet word with Vera assured him the women were better pleased and already had their mates tentatively fixed.

"I'm the only spinster left on the shelf," she said. "If you want to stake your claim you had better be quick about it."

She took good care to make it sound like a joke but he was not in the mood. He gave her an up-and-down look, grunted and went about his business. He had already weighed the price against the merchandise and he did not think the bargain was a good one. It was about then that he began to resign himself to being replaced.

Conscientious as he was, his resignation made itself apparent. The work went on as before, nothing that should have been done was neglected. But his attitude became passive instead of positive. In his preoccupation with his personal problem he failed to see the increasing discontent among the women.

Vera Jones came to him again. "It seems I get all the dirty work," she said. "You can't say I didn't warn you about this—and it has happened. The girls are leaving."

He was surprised. "I understood the wedding bells were due to ring any day—"

"You were mistaken. They've picked their men but they are not going to get hitched and settle here. They're going home. In due course their men will go home too."

"That's cheating!"

"It's fair enough from their point of view. But the ethics of it don't matter. They're fed up with Mars and—"

Burge cut in with scorn. "So much for statistics! World figures show that the Irish and the Spanish have the lowest suicide rates and somebody with a slipstick mind reckons that makes them the most stable nationals to send to Mars. They send me three of each and they want to go home after six weeks!"

"Because they're bored," Vera insisted. "A crusty old bachelor like you can't be expected to know better. Do you think a man is the only thing a woman wants of life?"

He gave her a straight eye. "You've had plenty experience. You tell me."

She bit her lip. "I've never taken that kind of crack without retaliation. This time I must, but don't ever do it again, Burge. Not ever again." She was shaking with anger.

She went on: "I didn't come here to plead with you for the girls' sake. I don't think you fully realise that this means the end of the colonisation project—that's why I came. What do you think will happen when the girls go back? How many volunteers do you think there will be in the future? Don't you see that you've got to make them stay? And the only way to do that is to make them feel useful, not just—well, stock cattle."

Burge lifted his hands helplessly. His whole appearance was so unlike the forceful driving person she had first met that Vera asked, "Don't you feel well?"

He said, "There is nothing for them. It's men's work, specialists' work. As for the future of the project, I won't be here to see it. I'll be back on Earth myself pretty soon."

Vera left. If she had stayed she would have said he was selfish, uncaring. She would have said all the wrong things. Instinct told her it would have been a mistake. He was too low in spirit to be kicked now. For six years Burge had been strong, he'd had to be strong for everyone on Mars. What he needed now was someone to be strong for him.

Ferguson was an efficient secundo. It was not his habit to pass the buck. As far as possible he handled his problems himself. But he thought the case of Vera Jones' conduct was beyond his jurisdiction. Reluctantly he reported to Burge.

"You'll have to do something about that woman," he said. "She's playing fast and loose, and I do mean loose. Everybody knows she was an actress. Some pretty lurid stories of her past are going the rounds and the way she's playing is doing nothing to discredit them."

Burge promised to look into the matter. He sent for Vera when Ferguson had gone.

She got her word in first. "The girls are staying. They want you to perform the ceremonies next week."

For a moment Burge forgot what he had intended saying. Instead, he asked, "What made them change their minds?"

"I told them I'm going to have a baby."

"You what?"

"Don't worry. I'm not really. But somebody had to do something to stop them leaving."

Burge shook his head dazedly. "I thought they were respectable girls. I don't get it. Surely your admission must scare them away more than ever."

Vera smiled. "You don't know the first thing about women. Babies are babies no matter how they are acquired. The girls will stick around because they believe I'll need their help. I've given them a mission. They're preparing like mad."

Burge was still in a spin. He tried to think rationally. He said, "What happens when the baby fails to materialise?"

"My original idea was to make it come true. Don't laugh—but before this business I had you picked out as my partner, Paul. Of course I'll have to give up that idea now. My reputation would ruin your authority. So instead, you will be very stern and deport me to Earth in a couple of months' time."

"What does that achieve?"

"In two months' time there will be some real babies to look forward to."

Burge laid a hand on her arm. "I'm just beginning to understand you," he said. "This must have cost you a lot."

His action broke her rigid self-control. She wept for a while then dried her eyes and apologised. "I don't often do that."

She sighed and continued, "Mars was going to give me a new life. Having the sort of career I had gave me no chance to find the right kind of partner. That's why I hoped my past life would remain a secret, that's why Verna Jose became Vera

Jones. "I believe it was mostly selfishness that made me want the project to succeed. If it succeeded I would not have to go back."

Burge disagreed. "If anyone was selfish it was me. I failed in my duties because all I was concerned with was my own tragedy. Did you know the new base commander is coming next month?"

It was her turn to touch his hand. "I'm sorry," she said. "The colony means a great deal to you, doesn't it? But you would have had to go sooner or later. This is a young man's world."

He knew she was not being offensive. "You may be right," he admitted. "And I suppose they'll be able to use my experience back home, although I don't much fancy myself behind a desk."

She moved adroitly off the subject. There would be plenty time later for reconciliation. "When are you going to tie the knots?" she asked.

He consulted his hand-drawn calendar. The men of Mars had retained the familiar twelve-month year and had allocated fifty-six Martian days to the year with adjustments being made at the end of each twelve months. He ran a finger down the dates.

"How about Friday?" he said. "The fortieth of December?"

Vera nodded and rose to go. "I'll tell them," she said. Burge also stood up. He faced her squarely.

"Vera—" he said.

Her eyes were soft to see his awkwardness. "Yes, Paul?"

He swallowed and went on: "When we get back home . . . you'll be there about the same time as me . . ."

He steadied himself and tried again. "You came out here to escape notoriety. I know a place where it is as lonely as Mars. I'm talking about the spacefield where I'll be working. Do you think maybe you and me could have a fortieth of December for ourselves?"

Fully fifteen minutes passed before she clamped down her mask and left.

Robert Presslie

In this concluding instalment John Brunner takes us on a fascinating journey through the paradox of Time itself as he draws the remaining strands of his complex plot together for the final climax. As he so well summarises, "This was neither the beginning, nor the end, for there is, was and will be, nothing but everything, which is the Universe." Complex ? The story will explain it !

THRESHOLD OF ETERNITY

By John Brunner

Conclusion

FOREWORD

Red Hawkins, sculptor in metal and stone living in California, and Chantal Vazeze a French nurse resident in London, are inexplicably brought together by a warp in the structure of Time itself. The 'accident' also deposits a badly injured man from the future with them. Chantal tends his broken arm and as he recovers he tells them that his name is Burma and they must help him to return to his own period as the fate of the entire human race depends upon it.

Against Red's will Burma forces him to handle a peculiar metal cylinder which eventually deposits the three of them several thousand years ahead of our time, where they are rescued by some of Burma's colleagues and taken to Centre, a huge spaceship somewhere in space where they meet Magwareet, a Captain of an anchor team in the year 4070. Red and Chantal discover that the human race in this period are

fighting a losing battle against an undefined enemy which is complicated by the presence at a number of points in the structure of the Universe by a Being of four dimensions. Warps in the Time continuum are breaking further and further back in history as the Being is affected by three-dimensional power surges from the opposing forces.

Magwareet has just returned from investigating the disastrous entry into the Solar System of a runaway city-ship from the region of the star Lyrae 129. Inside the wrecked city-ship he and his investigators have discovered and captured the first specimen of the Enemy the human race have seen. Red and Chantal hear the details as Magwareet explains them to Artesha Wong, the chief Co-ordinator or Centre—an electronic brain with the added edition of a human mind! Artesha had once been Burma's wife, but had been badly injured in an Enemy attack. Because her knowledge was so great a record of her mind had been made before she died and incorporated into the circuits at headquarters, where to all intents and purposes she was still a living thinking person.

At the same time that Red, Chantal and Burma had been thrown together in 1957 another technician, Wymarin, who had been investigating the possibility of communicating with the Being four dimensionally, had been thrown even further back in time. Magwareet is sent back to try and find him, taking Red and Chantal with him as being the only persons with any pre-20th century knowledge.

As Magwareet's anchor team approach the temporal surge indicated on the Time map where Wymarin is thought to have disappeared their ship is confronted by a gigantic Enemy spaceship, a huge black rod-like structure which could easily turn the Sun nova. By adroit manoeuvring, Magwareet manages to draw its fire until reinforcement ships from their Time arrive and defeat it. In the resultant battle another Time peak overlaps the 20th-century and transfers a war party of Croceraunian warriors from the 23rd-century into Russia.

Led by Chasnik, a raider captain, and Vyko a young graduate magician, the war party is equipped with frightening weapons and are soon pursuing a victorious campaign against the Russians. Magwareet decides that it is essential to preserve the balance of history intact and sends Red and Chantal, under cloaks of invisibility, to kill or capture the Croceraunians. Among the captives is Vyko, who they learn

is able to foretell the future by a four-dimensional awareness they think might help in contacting the Being.

Having removed the signs of Croceraunian temporal displacement, Magwareet then searches back for the secondary peak where Wymarin is thought to have been transported. It turns out to be in 17th-century Holland and he and Red disguise themselves as merchants and enter a large city where they hear tales of an alchemist who can transmute lead into gold. They are convinced that the alchemist must be Wymarin and their search is finally rewarded. Wymarin has urgent news to pass on to Artesha and the entire expedition together with captives returns hurriedly to the 41st-century.

Back at Centre Artesha is delighted at the discovery of Vyko's mental talents and temporarily puts him under the care of Red and Chantal until he can find his way about.

XV.

Take the Solar System, for example.

There was (or was there?) a moon of Saturn. Pickering, its discoverer, was an experienced astronomer unlikely to be misled. He observed his find carefully enough to determine such things as its period of revolution. There was also the fact that it was many times brighter on one side than on the other—an easy aid to identification. Despite all this, people hunted for it afterwards in vain.

There was also, possibly, an intra-Mercurial planet, which was given the appropriate name of Vulcan. Leverrier and other distinguished men believed in it, believed also that it had been unmistakably observed. Nonetheless, only a few decades after, it was established that it wasn't there.

No reasonable person considered adding the qualification "any longer . . ."

Tesper spoke diffidently. "Artesha, there's one very important point we haven't seen to. Our ship brought back forty other Croceraunians besides Vyko, you know. I want to know what effect we're having on history—and what ought we to do with them?"

"We simply haven't got enough information to say." Artesha seemed weary. "As I see it, we'll do least harm if we simply return them to the point at which the temporal surge first picked them up. But these surges have so complicated history we can't be sure."

"Have they?" said Red pointedly. "Are you certain their effect isn't already accounted for in the present?"

"Of course it is!" snapped Artesha. "But *which* present?"

"What do you mean?"

"We obviously can't tell whether the temporal surges have changed anything or not—we live through their consequences. We can't tell whether the present which would have come into existence if you had not gone back in time chasing the Enemy raider, for instance, might not have been favourable to us. In using and interfering with the results of these surges we may be sewing our own shrouds. Before your crew entered that long surge, was the actual present different from what we now remember—different from the present which your actions caused? Somewhere in a five-dimensional continuum there may be someone the equivalent of you, Red, doing something totally different at what appears to be the same moment of time! Think it over—I wish you better luck with it than I've had. Me, I get nightmares from it."

She broke off. "We must also investigate the possibility that the Enemy ship you chased into the twentieth century deliberately entered the surge in order to attack our past. Magwareet, I want you to see that attended to."

"Surely." Magwareet looked unhappy.

"All right. That'll be all for the time being."

Tesper went out straight away, but Red and Chantal waited for Magwareet, who seemed to be making up his mind to something. At length he spoke.

"Artesha, something has been bothering me. That Enemy raider which we followed into the surge . . . You warned us about it when we shifted twenty hours back in time. Why didn't you warn us when we passed that point earlier? Did you not know about it? If not, *why not*?"

"But I did," said Artesha. "There would have been no point in warning you before you shifted—"

"Listen! We were preparing to leave. Twenty hours before, this raider had entered the Solar System. Why was it not spotted and destroyed before it had a chance to enter the surge? Why didn't we know about it before we went back?"

"But—" Artesha hesitated. Then she spoke slowly, giving the words an air of puzzlement. "I—I remember the episode twice, Magwareet! Part of it is recorded in each of two memory banks. One time, I knew about it—that must have

been the moment when we were passing that instant normally. I could do nothing about it—”

“Then there’s your answer to the problem of the alteration of history. We do alter it. You couldn’t have it destroyed immediately because, in the far past, it had already been destroyed, three thousand years ago.”

“Analyse that, and you’ll have the whole solution,” Magwareet stated shortly. “You’re the only person who can do it, Artesha. We’ve interfered with history to such an extent I’m seriously worried. Did you actually order it to be left alone?”

“I—I don’t know! Magwareet, this is terrible! The human race is relying on my judgment, and I’m forgetting things—”

“There is no way in which you can forget things, Artesha. Except through mechanisms in your own brain, and you have the tools to deal with those.”

He stood for a moment, gazing at the featureless panels concealing Artesha, and then turned and went out.

Pausing beyond the door, Red and Chantal saw that their companion’s face was ashen with strain. He gave them a wan smile. “I’m sorry,” he said. “I had to warn Artesha about that—she’s the only person capable of psycho-analysing herself, and although the majority of her mind is now composed of artificial units which can’t go wrong, her actual brain-patterns—the human ones—are still fallible. Oh, but this tampering with time is risky!”

He broke off, and showed them the way to get about Centre’s gigantic complex of individual ships. As Artesha had promised, it worked to such simple rules that only one brief summary was necessary. Then Magwareet took his leave.

As they headed towards the department where Vyko was being taught Speech, Red muttered, “What a fantastic person Artesha must have been to go through an experience like the one she had and remain sane!”

“I suspect Burma had a lot to do with it,” Chantal answered. “Imagine being her husband . . .”

“Something’s changed since we’ve been away,” Red exclaimed after a pause. “Do you—smell—tensions in the air?”

Chantal nodded. “People are showing more signs of stress. It must be this news from Tau Ceti. Is that very close?”

"I suppose so—I don't know exactly. Here—excuse me a moment, Chantal." Red turned aside into a washroom, and she waited in the corridor outside for a few moments.

Just as Red returned, a movement at the end of the passage caught her eye, and she gave a terrified gasp. "Look !" she said faintly.

Red followed her pointing. At the far end of the corridor he managed to catch a glimpse of a man turning and going away. The only striking thing that he noticed was the other's hair ; it was as red as his own.

"I don't see what you mean," he began, but Chantal cut him short. She put out a hand and touched his shoulder, as if expecting to find him insubstantial.

"Red—didn't you see ? Didn't you see the likeness ?"

"I couldn't see his face, but I admit his hair was like mine. Well, what about it ? Is red hair so very unusual ?"

"Red, you don't understand," said Chantal desperately. "That other man was limping, exactly the way you do from sheer force of habit. He wasn't just like you, Red—he *was* you !"

Chantal seemed completely unnerved by the shock, and Red put his hands on her shoulders. "Listen !" he said urgently. "There are people from dozens of planets here at Centre—I expect lots of them have red hair. And what's so astonishing about a limp ? Maybe the guy had a sprained ankle !"

"But with the medical equipment people have now, sprained ankles just don't last."

"Well, this is the medical section we're heading for, isn't it ? Maybe he just sprained it a few minutes ago and is going to have it fixed. Come on, that sounds reasonable, doesn't it ?"

Chantal sniffed. "I—I guess so," she agreed reluctantly.

"All right, then. We may very well find him in the room ahead of us—let's go straight down and look."

Walking a trifle unsteadily, Chantal followed him the few remaining steps to their goal ; he pushed open the panel and stepped inside, finding a small bare cubicle.

After a moment a plump woman in green came out to them from the room beyond. "Yes ?" she said shortly.

Red explained their mission, and the woman nodded. "All right. I'm expecting to bring Vyko out of his coma in a few minutes now—if you'd just hang on, I'll call you in when I'm ready to waken him."

"Red," Chantal put in. "Red, ask Artesha if anyone like you is going around Centre."

He turned to her in astonishment. "Chantal, for goodness sake! We can't bother her with a figment of your imagination!"

"All right," said Chantal composedly, "I'll tell her. Just a moment!" she called after the plump woman. "Is there any way I can get in touch with Artesha from here?"

The woman stopped dead in the doorway and stared at her. "Er—er, yes, there is. One moment, please." She stepped very briefly out of sight.

When she re-appeared, there was a man with her who towered over her, fully six foot six tall; his face was set in a menacing expression, and—most alarming of all—there was something in the woman's hand that they didn't recognise, but which looked purposeful and which she kept very steadily aligned on them.

"Get behind them, Duarak," she said softly. The man moved with the speed of a pouncing lion, and Red and Chantal found him with his ham-like hands poised above their shoulders. "All right, you two. Explain yourselves. I should tell you this gun I'm holding will kill you before you can make a move, and it won't hurt Duarak either!"

"Are you crazy?" said Red in utter disbelief.

"Not at all," the woman told him grimly. "The communicator system here is perfectly ordinary—standard pattern. Artesha is always available from anywhere in Centre. I want to know why you asked that question!"

Red felt Chantal relax with a shuddering sigh. He himself couldn't help smiling. "We don't know our way around Centre yet," he explained. "The same thing happened to us, as happened to this man Vyko you have here. We're both from the twentieth century."

"Have you heard anything about this, Duarak?"

"Not a thing," the brawny man replied.

"All right. We'll have to check, then. Contact Artesha, will you?"

Without taking his eyes off them, Duarak reached for the wall behind and felt for a pattern on the studs below a communicator panel which they had not noticed.

"I apologise in advance if I've misjudged you," the woman in green said unsmilingly. "But since we discovered that the Enemy are oxygen-breathers, we daren't take a chance."

"What is it?" Artesha's familiar voice filled the air.

The woman summed up the situation, and Red and Chantal both felt glad when Artesha made a short and irritated answer. The woman lowered the gun.

"Sorry," she said without expression.

"Artesha!" called Chantal suddenly, as if on making up her mind. "Chantal here. I want to tell you something."

"Chantal!" said Red in annoyance.

"Let her go ahead," Artesha rebuked him. "Yes?"

"While Red and I were coming towards the section where we are now, I'm absolutely certain I saw someone at the end of the passage who looked exactly like him. Exactly—even down to his limp!"

There was a brief pause. "Well, that doesn't surprise me—there are several million people in Centre. But what you say about the limp is interesting. All right, I'll work through my memory banks and check up for you. That all?"

"Yes," Chantal confirmed, and when the communicator went dead, looked triumphantly at Red.

"You see? She didn't think it was ridiculous, did she?"

Red muttered something inaudible. "We have a job to do," he said pointedly to the woman in green, and she nodded.

"All right, come along."

Such complete economy had been observed in the use of the space available within the ships of Centre that even the theatre where they now found themselves was barely big enough for all four of them to stand around the couch on which Vyko lay. The tattoo marks on his arms and chest stood out vividly under daylight lamps.

The woman in green went to a cabinet whose shelves were full of shiny sterile equipment; selecting a percutaneous syringe, she administered a quick shot of some straw-yellow fluid. Waiting for it to take effect, Red noticed the hypnotic equipment which had been used to teach Vyko Speech folded tidily away from the end of his couch.

The magician yawned and rubbed his eyes, exactly as if emerging from an ordinary night's sleep. After a moment, he looked up at them, blinking.

"I—I feel different," he said, puzzled.

"Are you all right?" Red inquired, and the boy nodded.

"Yes, I feel very well. And I—I seem to understand things better." Vyko frowned. "I know where I am, and

I know that you've taught me your language by magic. Are you—?" He checked himself, raised his body into a sitting position, and made a quick pass with both hands.

"Excuse us," put in the woman in green. "Can you handle everything from here on? Duarak and I are wanted elsewhere."

"Yes, surely," agreed Red absently. "Vyko, I'm afraid we aren't magicians as you mean it. What you call magic, we call science, and it's rather different."

"I have been taught that word, and what it means." Vyko swung his feet to the floor. "And I can't tell you how wonderful it is. I expect you know all about me, don't you?"

"Well, not very much," Red told him.

"I was what we call a magician, you know, and I was taught all that the priests thought about the world, but I sometimes used to wonder if in the Old Days people had known better. Now I have the chance I've always wanted."

"What exactly did a magician do, among your people?" Red wanted to know.

"Oh, he studied the old books, and serviced small arms, and made the supplies of the Breath of Terror—I can do all those things," he added with pride. "But the most important thing about a magician was that he could look into the future. Priests could do everything else but that."

"And how does this talent work?"

"It's just something you know how to do. You can't explain it—many times my people tried to teach more people to do it, and failed. It's something you're born with, I imagine."

Comparing Vyko's enthusiastic acceptance of what had happened to him with his own overt hostility, Red felt a pang of shame. This was the right spirit—one of adventurousness.

"Well, we're going to show you all round Centre—that's this place where you are now," Red stated. "The same thing happened to us as happened to you—we're from a time in what to you were the Old Days, before the atomic war which destroyed our countries. But the people of this time know far, far more than we ever did."

"How much actually have you been told about where you are, and what everyone is doing?" Chantal inquired.

Vyko seemed to pay attention to her for the first time. He ran his eyes curiously up and down her, noting her obviously feminine body under her coverall. "Are you not a woman?" he said after some moments' hesitation.

Chantal smiled broadly. "Of course," she answered.

"And you also know about—science?"

"A little."

Vyko stood up, shaking his head in a puzzled gesture. "This is indeed a strange world I have come to. You see, among my people women can be neither priests nor magicians—they are never able to see into the future. Women's duties are—domestic, like tanning hides and preparing food and liquor, and bearing children. Is that not so now?"

"Women have always borne children," Chantal replied, managing to keep her face quite straight this time. "But now machines do so many tasks men and women alike can know about science, and think of the same things."

"I see that it would be so," nodded Vyko. "And are these some of the machines?" He indicated the banked medical equipment. "Indeed it is very wonderful!"

"You forgot to answer my question," Chantal pointed out.

"Of course. Well, I know that we are inside a metal—boat—that flies above the air. You call it a spaceship. But I do not understand how there is so much *room*!"

Red glanced wryly at Chantal. "Artesha said a lesson in the basics of astronomy might be necessary. Where can we go to show him space, and explain about the war?"

They took him to the master control centre from which the plans hatched in Artesha's incredibly complex mind were translated into terms of concrete action. This Vyko understood; once he had come to see what the battleground was—the vast empty reaches of space—he followed quite clearly the strategy of a struggle in four dimensions.

"How does he get a grasp of it so rapidly?" demanded the soft-spoken elderly officer who was their guide around the control centre.

"He has rudimentary four-dimensional awareness," explained Red. "We're hoping he can help us to communicate with the Being."

"Darned sight more useful if he could tell us what the Enemy was likely to do round Tau Ceti," said the officer unhappily. "Can he?"

"Maybe he'll be able to when he's been shown all round the set-up. Excuse us—we'll have to move on."

And they did so—throughout Centre's manifold departments. They saved until last the most overwhelming experi-

ence of all, remembering how it had affected them—looking out into deep space at the ball of the Earth.

They had been noticing for some time when they finally entered the ship orbiting closest to the planet that Vyko kept casting curious glances at Red. They hoped, though they felt unready to risk asking, that he was getting to be able to forecast things about them. Holding their breath, they waited as the panels rolled back and displayed the round, brilliantly green sphere that was their birthplace.

But Vyko took it without a qualm. He merely studied it for a few minutes in absolute silence. Then at last he gave a sigh.

"How wonderful to be able to *see* the truth, not guess at it," he said simply.

Red drew a deep breath. "Are you beginning to be able to see into our future, now?" he asked.

"It's very peculiar," was Vyko's slow reply. "Yes, I am, but—Red, I can sense something strange about you."

"What?"

"It's like when you cross your eyes. You see two things which are the same but from a slightly different angle. I find that when I look into your future—only the two things I see are not just the same thing from different points. They are separate."

They thought that amazing remark over in silence. Before any of them had a chance to speak again, the wall communicator which was in this compartment of Centre as in every other came to life. It was Artesha who spoke from it.

"I was listening to that," she said. "Red, will you take Vyko down to the department where Kepthin is studying the Enemy? I want to know if he can make prophecies about another species."

"Right away," agreed Red, and shut out the view of space again.

The fussy little alien biologist met them in person on their arrival, beaming all over his face. "We're making fabulous progress," he told them brightly. "Look!"

He waved down at the big hall below the gallery where they were standing. Men and women, with every appearance of extreme concentration, were watching the five-limbed alien creature move in a slow rhythmic kind of dance.

"I don't see—" began Red.

"We're controlling it," Kepthyn told him. "Its movements now are the direct result of our orders to it. It took us a lot of trouble, but we managed it. We can prepare coded molecules to make it perform more than twenty complex action patterns now ! From the spacesuit the thing was wearing, we've discovered what bands they use for long-range communication—in another few hours we'll be *talking* to it, and it won't be able to lie when it answers. But by the stars around us, its communication technique is extraordinary"

"How ?" Red wanted to know.

"It's an extension of the internal cell-to-cell contact. It's got a speech organ in which several billion different molecular patterns can be almost instantly synthesised—if we can adapt that, by the way, we'll have a powerful new means of synthesising plastics and so on—anyway, as I was saying, it amplifies the normal sub-molecular resonance pattern of about sixty of the possible combinations, and uses them like syllables to construct phrases with specific meaning. It's astonishing—"

"Ask Vyko if he's getting anything, or thinks he'll be able to," Artesha requested over a wall speaker. Red realised she must be watching their progress continuously.

Vyko was staring in fascination at the Enemy. When Red repeated Artesha's question to him he sighed and shook his head.

"I know I shall not be able to feel that creature," he said. "It is not possible even with animals on Earth. I am sorry."

"Oh, it's nobody's *fault*," said Chantal, touched by his obviously sincere regret at failing them, and he gave her a quick, warm smile. There was something extremely likable about this young barbarian.

"That's a pity," said Artesha thoughtfully. "Still, it was a very faint chance at the best. Red, Burma is setting up the conditions for his next experiment on the Being at the moment. I'd like you to go over with Vyko and see if you have better luck in that respect."

"All right. Can we go out to an anchor team direct from Centre ?"

"No, I'm afraid not. I've ordered a ship to wait for you at the nearest lock to you now. You'll find spacesuits near the lock entrance, and I've told the pilot to come in and show you how to use them. Being in free space affects people

different ways at first, but I think you should enjoy a little trip like this one."

"Okay," said Red, and beckoned for Vyko to follow him.

It was little, their trip; the pilot used high acceleration and it took half an hour. At first it was eerie being carried along between the unchanging stars on a skeleton of metal tubing to which their suits were merely clamped, but after a while they got their bearings and relaxed. The most frightening moment was not when they first felt the absence of gravity before the ship pulled away—the acceleration substituted for it soon enough—but their approach to the anchor team. Their pilot's skill was fantastic; he juggled the flimsy craft between the solid-hulled orbiting vessels so neatly that they missed one by literally six inches.

Sweating, they scrambled through the airlock aboard the control ship of the anchor team and stripped off their suits.

A panel on the wall of the lock gave them directions, and they found their way without trouble to the big technical room. Here there were seemingly endless banks of complex machinery; time maps glowed green from the walls, and many screens bore the red splotches indicating the existence of material bodies in the neighbourhood.

Down among the time maps was Burma. As they entered, he was swearing aloud, and Red gathered that he had made the latest of several ridiculous mistakes. He called out.

Burma looked up. On seeing them, he stopped what he was doing and came over to greet them warmly. But there was something distracted in his manner.

"Is something worrying you?" Red inquired blankly.

"Yes, it is—and it's such a peculiar thing, at that. It's quite put me off my work! Just a few minutes ago, as I was working at the far end of the room, I could have sworn I saw someone at this end who looked exactly like me."

XVI

Disappearances have never been confined to human beings, after all. Taking the proportions of habitable land and uninhabitable ice and wastes of ocean on Earth, one would expect to find the latter yielding many more mysteries—but unknown, because unobserved. Men vanished from the Marie Celeste—... But there is a strange prejudice about Friday as a day of

ill-omen among seamen. In an attempt to eliminate this in the Royal Navy, towards the end of the nineteenth century an "enlightened" Board of Admiralty laid the keel of a warship on a Friday. She was launched on a Friday and christened H.M.S. Friday; she was commissioned on a Friday and put to sea on a Friday under the command of a Captain Friday. She was never heard of again.

In the silence with which he and Chantal greeted Burma's statement, Red found time to wonder exactly what was going on at that moment. No one else in the technical room paid any attention; they continued to work. A little distance away, Artesha went on attending to the complex business of Centre. Further out, the ships circling the Solar System obeyed her commands, watched and waited and occasionally struck or were struck. All about and around them the Being did whatever it did (or was its purpose confined to mere existence?). Beyond that again, the Enemy plotted and planned, struck and were struck.

But everywhere the universe followed its incomprehensible ways: suns radiated, planets cooled, comets swung through their slow, age-long orbits or drifted from sun to sun until their substance was wasted by radiation pressure and they became clouds of the ever-present interstellar dust.

The galaxies wheeled their slow way through time. New members of their family formed from that same dust—taking an aeon about it, and yet not wasting time. Because time was not to be wasted. Time was something—something very abstract—within which they simply *were*, as they were in the insubstantiality of empty space.

And this is our home, thought Red. *Is anything—even seeing the unknown close at hand—more amazing than this?*

When he recovered from the shock, he found himself looking questioningly at Vyko. The youthful magician was studying Burma in a puzzled manner.

"Red," he said hesitantly. "Red, do you have a—a twin?"

"Yes," said Chantal with sudden emphasis. "There's another man going round Centre who's exactly like him."

Burma watched this exchange wonderingly, and Vyko turned to him, nodding. "That explains it," he said calmly.

"Explains what?"

"When I try to—feel your future, I get the same sensation that I do when I think of Red." Vyko repeated his analogy of seeing double. "And as you say you have a—a going-double—"

"Look, what is all this?" Burma demanded. Chantal gave a quick summary of her experience, and Red listened in mounting dismay.

"A going-double is a sign of disaster approaching," Vyko told them doubtfully. "And yet I do not read disaster in the future . . . It is said among my people that to see oneself is a mark of death near at hand, and yet . . ." He shook his head as if giddy, and walked a few paces to be alone.

"Is this the result of our tampering with time?" Red asked apprehensively, and Burma looked worried.

"Possibly. We'll have to get in touch with Artesha about it."

Artesha sounded actually tired when they told her what had happened. "I'm afraid this is the beginning of something very big," she said. "And I can't spare the time to study it properly! We're getting reports in of an Enemy attack massing—they've been at it for days, but up till a little while ago we thought it was aimed at Tau Ceti. It isn't. The Enemy are about to mount a full-scale offensive on the Solar System."

"Can we stand it off?"

"I don't know. I think so—we're rushing in extra resources as fast as possible, almost faster than we can handle them, and production of our most modern ships is being stepped up to maximum. Have you had any results with Vyko?"

"We haven't asked him yet," said Red, and called the boy back. "Do you feel any special awareness of—presence?" he asked anxiously.

Vyko shook his head. "There is something," he began, and frowningly changed his mind. "But it is no more here than anywhere else. I have always known of a *sort* of presence"

"That fits," said Artesha. "The Being exists at least as far back as the furthest temporal surges. Have you been through the ship to find whether there actually is a double of Burma on board?"

"But there can't be," said Burma briefly. "How did he get through the airlock without—?"

"Did he get through the airlock?" said Artesha significantly. "Remember, that specimen of the Enemy found its way into the city from 129 Lyrae—"

She broke off, and when she spoke again was excited and dismayed. "Tesper has seen his going-double," she said.

"This is too big," said Red abruptly, and Artesha agreed.

"I'll get Magwareet on to it right away. We'll have to turn Centre and all the anchor teams inside out—"

"Have you considered the possibility that we were deliberately allowed to capture that Enemy?" Chantal put in. "I mean—could it be signalling somehow?"

"That was a chance we had to take. But if, somehow, they are managing to get duplicates of existing human beings into our defences, we're headed for *real* trouble."

"You had already thought of that," Red realised, recalling the behaviour of the woman in the medical section.

"Of course. Magwareet will be over with some helpers to investigate as soon as I can arrange it."

Burma turned abruptly back to his team. "We've got to get this test set up quickly," he barked. "How's it going?"

"It'll take another hour," said one of the technicians.

"Then we're all ready."

"Not bad," admitted Burma grudgingly. "I'm afraid you and Vyko will just have to stand around for the time being. Maybe it'll give him a chance to get his bearings properly." Red and Chantal signified agreement.

Withdrawing to one side of the cabin, Chantal murmured, "I can't understand why they take all this so *calmly*."

"I guess they've just been schooled into concentrating on their own problems," Red answered softly. "Time's too valuable to spend worrying about questions you can't solve yourself."

The hour was almost half gone when Magwareet pushed his way into the room, still wearing his spacesuit. Frost was melting on the metal shell, and his helmet, thrown back on his shoulders, was misted inside and out. "Go through the ship," was his curt order to the men and women who followed him, and they dispersed with an air of grim intentness, weapons ready in their hands.

"Sorry to break in, Burma," the co-ordinator said shortly, "but we have to check everywhere that a going-double has been notified. Won't disturb your equipment."

Burma nodded, and they carried on working. When the members of Magwareet's party returned, they had nothing to report, and with a short word of thanks, Magwareet prepared to go on elsewhere.

Red felt someone pluck at his sleeve, and glanced down to find Wyko staring at him worriedly. "That man—the one in the metal clothes," he said.

"What about him?"

"He too has a going-double! I don't know where, but I can sense it."

Red raised his voice and yelled after the departing co-ordinator. Magwareet turned back.

"Has your double been reported from anywhere?"

"No—not as far as I know," Magwareet answered, staring.

"Vyko says you've got one."

The young magician looked almost on the edge of tears. "It is beginning to seem as though everyone in this day and time has one!" he exploded. "Some people's are very close to themselves, and hard to make out, like those of most of the people in this room. But Red's, and yours"—Vyko nodded at Magwareet—"they are unmistakable."

Magwareet crossed the room with a bound despite the weight of his suit, and slammed open the communicator. "Triple emergency!" he said. "Anchor team" (he gave co-ordinates quickly) "Magwareet speaking, to all units, all anchor teams, all ships! Somewhere there is a double of myself. Notify and capture if possible on sighting it. Any other doubles must be reported instantly."

"Wyman!" said Burma suddenly. "What are you doing here?"

They spun round, to see the familiar dark-haired man who had called himself Elias standing between the banks of instruments.

"You weren't quite ready to test," Wyman answered.

"I came over to see if you were doing exactly what I said."

"Where's he supposed to be?" Red asked a technician near him, whispering.

"Monitoring the test from another anchor team's ships, just in case something goes wrong," was the answer.

Wyman walked slowly towards them, eyes flickering over the massed dials and lights. "Not quite!" he said at length. "Listen, Burma, I've been doing some figuring on a new tack. Suppose instead of simply trying my original test on a smaller scale, you do this."

He went off into a language so full of technicalities they could no longer follow. Burma and his technicians, however, seemed to appreciate his reasoning.

Burma, in particular, was shaken when Wymarin had finished. "If I get you right, what you're proposing is to set up a *working vocabulary* based on a number code, which we can key to a mechanical translator and actually speak to the Being!"

"Why not?"

"Hello, Burma," said a voice from the wall communicator. "Wymarin here. You should be almost set to go ahead now; shouldn't you?"

They wheeled together. In the instant when their eyes were all off him, Wymarin's going-double *went*.

Vyko whimpered. "This must be the end coming—for all of us! Never can there have been so many omens of ill-fortune! When every man and woman has a going-double—"

"Quiet!" snapped Burma, and explained to Wymarin—the real one, speaking from the communicator—what had happened. "Of course, we daren't trust what he told us, though it seemed logical enough. I think we'll have to go ahead right away—if there's a chance of communication with the Being, we must grab it. Magwareet—pull your team out of here and get on with your own job. Red, Chantal—do you want to go with him? It's risky, staying here—"

Vyko turned mutely appealing eyes to him, and Red replied firmly that they would stay. Hectic minutes of preparation passed; then everything was set for the great experiment.

Licking lips that had suddenly gone dry, Burma gave one final glance around his complex equipment, smiled forcedly at his anxious-looking team, and pressed the switch to initiate the signal.

Vyko gave a scream of pure terror and slid to the floor unconscious. A glass-encased indicator light burst and showered the opposite panel of dials with broken glass. The dials themselves wavered back and forth, and then stood still exactly like a human being torn between two courses of action.

This much Red took in before Burma indicated a livid green time map before him, and said, "This is it, my friends—we're headed for the beginning of Time."

XVII

Extract from paper read to the British Society, Physical Division, June 3rd, 1974 : "It has now become abundantly clear—too clear, I regret to say, for some of the less flexible academic minds among us (cries of "Shame!" and loud applause), that we have for far too long been attempting to describe the universe in terms of petty-minded preconceptions as bad as the idealistic tenets of the earliest Greek philosophers. In many ways we have never succeeded in freeing ourselves from bondage to Aristotle! We have spent as much time explaining away as we have explaining."

Charles Fort, the apostle of doubt, on the same subject many years earlier : "A superstition is a hypothesis which has been discarded ; a hypothesis is a superstition which has not yet been discarded."

The instant it happened, Artesha's fantastic mind began to balance her ledger. The reports that were streaming in did not make reassuring reading.

Net loss : hundreds of thousands of irreplaceable men and women—skilled technicians, scientists, experts in the fields most desperately needed by the human race ; material by the millions of tons, including precious records inscribed in the memory banks of Centre (that was the first loss Artesha became aware of—it was as if she had lost part of her own memory); ships by the score, both civilian and military.

Net gain : one piece of information about the Being.

It was not enough.

The temporal surge had cut a swathe right through the defences of the Solar System. A gap yawned towards Polaris which the already extended lines of patrolling vessels could never hope to fill. A few asteroids had gone along with the rest, and a gigantic volume of dust.

Magwareet was the first person to demand whether there would be any change in her previous directives in view of the disaster. She answered briefly that he was too far involved with the problem of the going-doubles to back out now. What she was frantically trying to decide even as she spoke was how much and what had gone from her memory ; that could never be replaced, because the energies of the temporal surge would have wiped every trace clean away.

As big, but not so immediately important, a void had been left in her whole life, moreover : in that cartwheeling ship, headed this time for the Being alone knew where—and when—was Burma, whom she loved.

She contacted Wymarin for the newest data on the chaos boiling through the continuum, and the little scientist gave her a grim summary.

"We can't track this surge, Artesha. It goes beyond the furthest range of our instruments, and it's still gaining momentum when it disappears. We can't begin to guess where they'll wind up. Some of them may witness the formation of the Earth, or starve to death in a Carboniferous forest, or even fetch up with a crash against the wall of the Beginning of Everything.

"Whether the instruments they carry will enable them to find their way back into the surge after they are thrown out at the other end is problematical. I'd say it was highly unlikely. But I'm not the expert on temporal surges—only on the Being. And I can tell you nothing more than this about the effects of that experiment : we probably did succeed in getting through to it when we tried the test for the first time, and I got thrown back to the seventeenth century. But maybe we—sensitised it in that respect. At any rate, the violent result we got when we repeated it suggests something like that."

"Boil down your data—whatever you have—and let me have it as soon as possible," directed Artesha. "There may be something in it—anything—which will give us a clue."

That was a slender hope, she reflected sadly as she broke the circuit on Wymarin's acknowledgment. There were a dozen people clamouring for her attention. Selecting one at random, she found it was Kepthin, the biologist supervising the study of the captured Enemy.

"I've got good news," he opened enthusiastically, and Artesha cut him short.

"Have you been affected by this temporal surge?" she asked brusquely. "If not, get out of circuit—there are people with troubles waiting."

Kepthin sounded blank. "What surge? I haven't been near a time map for days. I'm sorry if you're in a hurry, but what I have to say won't detain you long. We can communicate with the Enemy—talk to it."

Artesha's spirits rose a fraction. "What have you got out of it so far?"

"Oh, nothing yet. We're breaking its language by analysing it from basics. But we can duplicate all its speech elements, and in just a little while we'll be able to talk to it fluently."

"Let me know when you do," ordered Artesha, and cut off. She immediately regretted being so short with him—after all, he had brought her the first really constructive achievement in far too long—but she had no time for that.

Keptin was turning away from the communicator, wondering with half his mind what could have put Artesha in such a panic, and worrying about it, and using the other half to review progress on a slightly-less-than-conscious level, when the doors of the hall opened and Magwareet's team, still cold from space, came in.

The co-ordinator approached him and nodded a curt greeting. "Have you had any going-doubles show up in here?" was the next thing he said.

Keptin shook his head. "I heard something about them a little while ago, but we've had no cases reported from here." He hesitated. "What exactly *is* going on?"

Magwareet seemed to have his mind on something else, watching his team fan out discreetly and begin their thorough—though unobtrusive—sweep through the hall. He saw several of them stop and wait until one of the technicians came to a pause in his work, then ask a question.

"That fits," he mused half aloud. "If it *is* being directed from or by the Enemy, they'd try and draw attention away from the captive—I'm sorry," he added at proper conversational level. "I was far away." He gave the biologist a quick rundown on the appearance of the mysterious doubles.

Struck by a sudden thought at the end of it, he gave Keptin a slow glance. "I don't suppose you've run into any creatures which have the power of—of disappearing, in your study of alien biology, have you?"

"What do you mean?"

"We've established that these going-doubles, as Vyko named them, can beyond doubt *disappear*. Without moving, without hiding. They don't do it when someone is watching them—but they're careful to appear only in places where they will not immediately be suspected. Many of them have been observed to go into rooms with only one exit, and never come

back; others have just melted into the air when the audience's back was turned."

Keptin was startled. "No! Nothing like that has been heard of. I suppose you've ruled out the obvious—chameleony, proteanism, transparency, elongation and so on? Those are all fairly common protective devices."

Magwareet looked interested. "Elaborate," he requested.

"Well, chameleony explains itself, I think—instantaneous response to a background in terms of colour match and surface texture. There's a creature called Polyglossus Toshii which Hideko Toshi found on Tau Ceti II which can match virtually any colour scheme in the infrared range in less than half a second. Proteanism is less common—I can only think of two or three animals bigger than a mouse which use it to any extent, and they're all slow-moving beasts from high-gravity worlds. Transparency—more strictly matching the refractive index to that of the air—is a permanent property of the body substance, and only slightly variable. Pseudocynus ascopos from 129 Lyrae exhibits the phenomenon quite markedly. But it's not something the creature can turn on and off—it just *is* transparent, and that's all. Elongation—again that's not known in any highly organised animals, but there are worms which can expand and contract up to five or six hundred per cent—far too thin to be visible when they're at full length."

Magwareet shook his head at the end of the long recital. "Our checks would have revealed any tricks like that. No, I'm afraid it isn't just a protective device—"

One of his team called to him across the hall in a sibilant whisper. He excused himself to Keptin, and, giving one final glance at the five-limbed bulk of the Enemy about which the controlled busy-ness of the gathering revolved, led his party to their next destination.

He had been itching to get around to this one for some time, but he had been forced to wait while the data on the new temporal surge was evaluated. Now, at last, he was free to get at the man whose going-double had made the most spectacular exit of all: Wymarin.

The scientist greeted him absently when he arrived, stood in a brown study for some minutes while he waited for the team to begin their search, and then burst out, "For all the good I've done here, I might as well have stayed behind in seventeenth-century Holland!"

"What do you mean?" Magwareet said quietly.

"Look at the result of our tests!" Wymarin indicated the broad sweep of a time map which shone green from rim to rim. "We've caused the biggest disaster we've yet suffered, and got no profit out of it."

Magwareet waited for him to relax a little; with an effort, Wymarin achieved calmness. "I'm sorry," he went on. "But it's completely disheartening. What can I do for you?"

"What do you know about the appearance of your going-double?"

"I know hardly anything about it. It showed up aboard the main ship of Burma's anchor team, and I only got the barest details over the communicator." He summarised them.

At the end, Magwareet remarked thoughtfully, "Did you ask for details of the change your going-double recommended in the projected experiment?"

"No! Why should I?" answered Wymarin, surprised. "I—oh, I see what you mean." His change of expression might have been comic under other circumstances. "You mean I took it for granted that the recommendations were hostile and designed to cause damage, whereas I shouldn't have done."

"Exactly," said Magwareet, and there was a long pause.

"As it happens," Wymarin said eventually, "even careful planning couldn't have produced anything more damaging than what we actually did . . . Is there a chance that this going-double of mine will turn up again, and perhaps give us the information?"

"I don't know. So far we haven't had any cases of a re-appearance—these duplicates have just shown up, whether for a purpose or not, and never been seen again. I'm inclined to feel that Vyko's beliefs about them may have a grain of truth," he added pessimistically.

"What does he think?"

"According to the legends of his time, to see one's going-double is a sign of impending death."

"Have you *any* idea what they are?"

"Not yet. There is one very suggestive point about them, though. Did you hear that mine had been seen somewhere?" he put in parenthetically. "That is that every one of the originals has been through time, either in a temporal surge or in one of our own ships making a hop."

"Very interesting," said Wymarin. "Anything else?"

"That they can disappear into thin air."

"Well—" Wymarin seemed to be fastening on a new string of ideas to get the memory of the crisis he had caused out of his head. "Well, that isn't unexpected, if they're a by-product of temporal co-existence . . . Can you narrow it down still further—to people who *have* co-existed with themselves in a temporal surge or otherwise? It strikes me as feasible that on returning to one's own time after having been two ways through the same temporal surge, duplicates might emerge."

"That's the sort of thing Burma is wanted for," Magwareet commented. "All right, I'll try and establish that. All clues are helpful at the moment. But what has that to do with disappearing—?"

"Look at it this way. Suppose that our interferences with the past have actually caused divergencies in the main time-flow. That's to say, in a fifth-dimensional continuum there exist several parallel presents each dependent on a change effected in the past. Now if a great enough degree of correspondence existed between a place in one of those other presents and our own present, it is possible that people might take—unknowingly—a turning in a direction which leans through the fifth dimension.

"Assume that the universe has a strong tendency to remain Unified. Our original researches into four dimensional existence suggested that probability. Then my going-double might have been firmly under the impression that he had remained in his own present and was giving information to the Burma of his own present. However, if that information had been acted upon, it would have ironed out one of the distinctions between the two time streams. Follow me?"

"I do indeed," said Magwareet with rising enthusiasm. "You imply that all the appearances of going-doubles may be the result of this unificatory tendency?"

"Exactly. Now suppose you investigate the idea that a going-double, on vanishing, returns 'through' the barrier between parallel presents. We've got equipment that could detect the space-time stresses I imagine as resulting from that."

"Give me details and I'll get it in hand at once."

The wall communicators suddenly crackled into life, and Artesha's familiar voice came to them. "Attention all units!" she said. "Triple red—this is a major policy factor. I have

had a report from Kepthin, head of the team studying the captured specimen of the Enemy. He reports that his technicians have succeeded in establishing communication with it. I have carefully examined his results, and agree with him that there is no reason to doubt our complete failure in attempting to understand the motives of the Enemy in their war with us.

"Their attacks on the human race are a purely secondary consideration. Their real and only objective is the final destruction of the Being!"

XVIII

An analysis of the opinions of the human race regarding that imponderable, Time, is illuminating.

It is not (which is interesting !) an innate item of experience. The Zunnis, so we are informed, have no concept of direction or length of time. Or hadn't, until contact with more sophisticated world-pictures.

The most widespread image of it is that of the river, bearing us, as driftwood, heading to the sea, past objects on the bank we recognise as events.

The dream of freedom from it finds expression in the ideas of Eternity, and Nirvana.

It obsesses scientists, philosophers and mystics alike. Dunne suggested that it might be possible to "remember" events which had "not yet" happened; Eddington, with his streak of mysticism blending into his scientific background, defined time as "an arrow which points the way in which entropy is proceeding."

It is of importance to note : (a) that entropy is the tendency of the cosmos to develop towards a state of ever greater randomness; and (b) that you, like all other living organisms—the term "organism" itself has that implication—are a localised reversal of that universal phenomenon.

"Somewhere out there," said Burma in a voice that carried through the room, "suns are being born, planets created . . . Somewhere out there, if we could only watch and understand, we could find the answer to every question that has ever puzzled the human race."

His words opened up in the imagination of his listeners a vista of incredible knowledge. It was as if their consciousness was suddenly no longer bounded by the walls of the hull;

they could feel themselves on the verge of *seeing* the things he spoke of.

Like a cinema film run backwards, Red thought. The whole universe, tracking steadily and faithfully backwards towards its beginning—and they could not see it.

A little stiffly, Chantal went forward and bent to attend to Vyko, lying on the floor. The movement broke the spell, and the crewmen and women turned to seek some task they might use to occupy their minds.

"What has happened?" Red inquired of Burma. The slight, brown-skinned man answered while studying the green-ivid time maps.

"Somehow, we hit the Being on a sore spot. This is a convulsion beside which the one that threw me back into your time was a mere twitch! Any sign of abatement?" he called out, and one of the technicians replied.

"If anything, the surge is building up!"

"On Earth now," said Burma sombrely, "men are eking out their existence in caves and shelters made of branches. In a little while, there will be only apes, and before that again the reptiles will rule the planet . . ."

A curious feeling of inversion came over Red as he heard that; somehow, the way Burma had used *will* in speaking of the past seemed significant, but he could not trap the elusive concept, and Chantal interrupted the train of thought.

"Burma, there's something I don't quite understand. Why are we experiencing normal time even though we're being thrown backwards? It makes it almost impossible to accept the fact!"

"Are we?" Burma said pointedly. "Has it never struck you that if time *were* to go backwards, it would make no difference at all? At any given moment, you would still recall what you thought of as the past; your awareness would be identical in every single 'now,' no matter which way time was flowing. There is no instrument at all by which one can decide the answer."

He broke off. "Is Vyko all right?"

"I think so. But you still haven't really answered my question."

"What we think happens is that the forces inside a temporal surge cause an encapsulation of the space surrounding the transferred object. The distortion of space around the capsule has an effect like the surface tension of a liquid; we can detect its presence only by implication."

There was little they could do during the uncontrolled flight into the past. They monitored their instruments ; at intervals they attended to Vyko, who seemed to have fallen into a deep coma—they could theorise about the cause of it, but his consciousness was completely inaccessible.

They were, deep down below a protective illusion of normalcy, frightened beyond words.

Nearly a day had been measured by the clocks on the walls when the first gap appeared in the greenness of the master time maps. Something crept into the air—a sense of destiny, a sense of survival.

"At least," Burma told them, studying the instrument readings, "we're going to emerge into the real universe. After that—"

"After that," said a technician baldly, "the temporal energies will have overloaded our instruments until they are completely useless. What can we do about it?"

The helplessness of their situation was only too clear. Burma shut the technician up with a scowl, and leaned excitedly forward. "We're emerging," he said tensely. "I want you to watch those dials right up until the moment they stop registering altogether."

The instruments were not the proper ones for studying a temporal surge, but they could be used—they were designed for investigating the fourth-dimensional extent of the Being. They revealed that they would be tossed up from the main peak, not a secondary one ; the same could not be said of the rest of the team's ships, which were scattering already.

"And no time-travel equipment either," Burma muttered. "At this stage of the universe's evolution, probably no planets where we could land and construct such equipment—if our ships had been designed for landing on planets!"

They broke free, and for better or worse their doom was sealed.

Burma, tight-lipped, walked briskly from the room. In a few moments he called back to them over the communicator, which was still functioning for some reason.

"Come out here," he said shortly, and they obeyed without thinking. Red and Chantal were among the first to pass through the door into the only room in the ship from which there was a direct view into space.

"This is a sight no human being has ever seen before," said Burma into silence, and they stood transfixed.

At first it was incredible; the eyes refused to take it in. Then logic supervened, and they began to be able to understand what they saw.

Beyond the port the sky was on fire. It shone so white it appeared almost cold. Nowhere was there blackness—nowhere at all.

"What we are looking at," said Burma softly, "is the universe when young. Those are all the stars which we are used to seeing scattered across hundreds of parsecs. Here they are so close some of them are only light-hours apart. Probably the calamitous expansion which we know about has only just begun. 'Only just,' of course, in terms of the universe's age.

"We have come hundreds of millions of years."

"Why is there no black in the sky?" Chantal demanded, almost with a sob of terror.

Red was so obsessed by a discovery and a memory that he almost failed to hear the answer. The discovery was that, once one's eyes were accustomed to the sight, one could tell that every star in the heavens was a different colour. Most were white—diamond-white—with subtle gradations, but some were blue, some yellow, and some few shaded all the way to the deepest imaginable crimson.

When he was a small boy, he had learned that jewels were dug from the ground, and he had pictured a jewel-mine, its walls sparkling, its floors sparkling, its roof sparkling—every inch in sight giving back multi-coloured fire.

And here was the reality.

"The universe," said Burma, "is still so small that the light of the stars does not fade beyond visibility before it makes the complete circle. Beyond the near stars, out there, you can see *the other side* of the stars which are behind us as we stand now. This universe is like a gigantic hall of mirrors."

Something J. B. S. Haldane had said in one of his essays came back to Red. What was it? "I imagined myself in a —" What kind of space? *Riemannian*, that was it. "I was standing on a transparent plane. When I looked up, above me I could see the soles of my boots turned backwards . . ."

He had once tried to express that in visual terms in one of his sculptures, and failed. And now here was the blind force of Nature interpreting it to him on a scale he had never dared to imagine.

"Do—" He was surprised to find his throat so dry. "Do you think there might be life out there somewhere?"

"I doubt it," said Burma. "Almost certainly there are no planets. Those aren't the stars we know, of course. Those are immense aggregations of dust and gas, barely beginning to radiate—in fact, most of their energy is probably still coming from straight gravitational contraction."

And this is the human race, he suddenly thought. The idea hit him in the pit of the stomach, leaving him limp with awe. *Here am I, tossed into the very earliest days of the universe, and I can speak with certainty of things which no living creature has ever witnessed!*

"Perhaps, after all, time has neither meaning nor importance," he reflected aloud. He looked about him, to find that he was alone with Red and Chantal; everyone else had returned below.

"I don't know if you can understand this," he said after a pause. "But—well, think this over. Just a few centuries ago, maybe even less than that, *time began*. Everything began! You can't say 'before that,' because there *wasn't* a 'before.' There was nothing. Nothing at all!"

Chantal shivered, and her face showed that she was trying to control it; Red put his arm round her and drew her close.

"And here are we, a handful of human beings," Burma finished. "Standing on the very threshold of eternity."

"Red," said Chantal softly, "do you think this was worth it?"

"What do you mean?"

"It seems unlikely that we shall get away from here, doesn't it?" the girl stated flatly. "Do you think it was worth it, for the sake of seeing this?"

Red had not begun to think about it like that; it took him a moment to utter the answer, though he never had a doubt of what it would be. "Yes! Yes, I do!"

"So do I," said Chantal. "I never understood it before. But I suppose this is the feeling which was the reward for the first people to climb Everest, and Columbus, and whoever the first man was to fly to the Moon . . ."

Burma looked across at them and knew a feeling of envy. For him, there was no one—Artesha was apart from him by uncounted millions of years.

And the husband of Artesha could never be satisfied with anyone else.

Through their stillness cut a cry with the suddenness of a lightning bolt. "What was that?" Red demanded, turning swiftly, but Chantal had already drawn the correct conclusion.

"It sounded like Vyko," she said, and hastened out.

Other members of the ship's crew had already responded to that heart-tearing scream; when Burma and Red followed Chantal, they found her bending over Vyko with a tense expression. The boy's eyes were wide open, but they were unfocused, staring at nothing.

"Vyko! What is it?" rapped Burma, and the boy moaned a little. Passing his tongue over his dry lips, he muttered a few words.

"What did he say?" demanded Red, and Chantal stood up.

"Something about everything coming to a stop," she said uncomprehendingly, and then, as the possible significance of the remark hit her, she put her hand over her mouth. "Burma! Do you suppose—he can see *backwards* in time, as well as forward? Past the Beginning, I mean?"

"Possibly," Burma nodded. But this guess was immediately demolished by Vyko's next words.

"Nothing!" he moaned. "Nothing at all! Only stars and stars going on forever!"

"What do you mean?" pressed Red, leaning towards him.

"Can't you tell us what isn't there?"

"*Something!* Something that's always been there before, in my time and yours. Something huge and friendly and safe. And now I'm alone!"

"The Being," said Burma softly. "He can only mean the Being. But how did we escape from it, if the temporal surge threw us back here—?"

"Inertia?" suggested Red. "The Being, you once told us, disliked the neighbourhood of suns and high-energy concentrations. The whole *universe* is a high-energy concentration this early. Suppose it doesn't extend this far back? Then we might have been thrown past the end of the surge by the residual violence . . ." His voice trailed away.

"We *are* alone," said Chantal greyly. "Nobody in the universe but ourselves."

"Think how infinitely worse it is for this poor kid," Burma reminded her. "He's lost something that's been a part of his very mind all his life. He's aware in four dimensions, and in one direction there's nothing to see, and in the other everything he knows is too far ahead."

"Look !" said Chantal abruptly, and they glanced back at Vyko. He had relaxed on his couch with a smile of delight on his face.

"Ashtlik !" said Burma. "Has anything happened in the last few moments ?" One of the technicians stepped back into the instrument room. "Is it back, Vyko ? Is it back ?"

"Yes !" whispered the boy in sheer delight.

"We just durated past the end of an important secondary peak !" Ashtlik called out. "Burma, you know this means we've been wrong about the Being from the start ! If these surges can extend past its limits, it needn't be a four-dimensional creature—"

"Time enough to worry about that later," said Burma. "Vyko, is everything all right now ?"

The boy, his eyes closed, looked faintly puzzled. "No, it's too small. Somehow. But it is really there, I'm sure. I—I think it's trying to talk to me."

"And we wasted all that effort on devising an instrument to communicate with the Being," said Burma bitterly aware of the consequences of their last disastrous attempt. "We had our instrument in the palm of our hands ! Vyko, can you make it understand ?"

"Yes, it understands. It's trying to explain to me what it really is. I—I think—" He got up, rather unsteadily, from his couch, and walked towards the observation room, brushing aside the hands that sought to restrain him.

The others followed in silence. Vyko paused before the massed glory of the suns, staring fixedly in one direction, for fully half a minute before he shook his head. "I see," he said, "but I do not understand."

Burma pushed his way forward and followed the boy's line of gaze. After a moment, he leaned forward as if that inch reduction in the distance would help to clarify what he saw. Straining their eyes, the others made out nothing but an oddly-shaped blot of darkness on the shining sky.

"Some time ago," said Burma after a while, and the remembrance that that "ago" was really millions on millions of years in the future again brought shivers to Red's spine, "Artesha gave directions for certain of the ships in Centre containing her memory banks to be heavily insulated against high energy-levels. I remember watching the work being carried out. I never got around to asking her why only those

few ships were so armoured, but I presumed they were repositories of vital information for use in case the Enemy ever did invade the Solar System.

"But the work which was carried out on them left them a different shape from any other ship in the sky. They *are* quite unmistakable."

It was a moment before anyone got the significance of that present tense. Red was the first to try and utter his conclusion.

"You mean—*those*—?"

"Yes." It was Vyko, unexpectedly, who answered, in a clear and confident voice. "Those ships over there are part of Artesha's memory. They are the only part of her which can stand the concentrated stress of space and time at this early stage of the universe's existence."

Dryly, the body and voice of Vyko added, "In case you have not yet realised, you are talking to the Being."

XIX

Keptin to Artesha : Herewith fullest possible vocabulary of the Enemy language, together with details of their communication bands.

Artesha to all units, triple red : Enemy mass attack being mounted from direction of Tau Ceti.

Wymarin to Artesha : Space-time distortions detected in association with materialisation and dematerialisation of going-doubles bear strongest resemblance to manifestations already known to be connected with activity of Being. Details separately.

Artesha to all units, triple red : Investigate possibility that Being is non-hostile or actually friendly. Analysis of all its activities urgently reviewable in this light.

Artesha to Magwareet, unofficial : Magwareet, for pity's sake help me !

The desperate urgency of the plea brought Magwareet in panic and haste. But he concealed his emotions as far as he could from Artesha's view, although he was no longer certain if such dissembling was effective with the immense volume of knowledge she had at her command. He had to come into her presence, for it would not be wise to let the conversation he expected get to the ears of everyone.

"What is it?" he asked, as calmly as he could.

"Magwareet, you remember asking me why I didn't warn you of the Enemy raider which flew into the temporal surge you were using to go in search of Wymarin?"

"I do."

"I had the answer. I received a solution signal from the banks I had put to work on it just before Burma initiated his disastrous experiment. I'm certain of that, because the notification is recorded in one of the memory banks I still have."

"But the solution itself, and all the relevant data, were in the banks which have gone into the past."

Magwareet started to say something, but Artesha interrupted. "Let me finish! Do you recall that some while ago I had a group of my memory banks specially insulated?"

"Yes."

"It is those banks that have gone! *Only* those! But they also contained the reason why I had them insulated. I can do no more than guess at the reason why I did it—and all my guesses lead to one conclusion."

"Which is?" Magwareet waited attentively, feeling on the brink of a great revelation.

"That I have had knowledge of the future available to me—somehow—and I haven't made use of it. Magwareet, what *can* have happened to me?"

Magwareet knew that Artesha must have drawn the same—the only possible—conclusion. He steadied himself and voiced it with dispassionate lack of emphasis.

"Someone, or something, must have been tampering with your memory, your whole mind."

"And there is only one possibility, who it could be. The Enemy!"

Magwareet waited a little while longer, and then, realising Artesha could not supply the missing statement herself, finished for her. "I'm sorry, Artesha. You're wrong. There is a second possibility—and a much more likely one. The only person in the universe who could have tampered with your mind is *yourself*."

If Artesha had had human lungs any more, she would have drawn a long, shuddering sigh. "Yes, Magwareet. Do you suppose that I, like so many other people, have a going-double who is not quite the same as myself?"

The idea staggered Magwareet for a moment. He had a momentary impression that he had seen a vision of some all-embracing truth, but it was gone, leaving him fumbling for

the tail-ends of thought which had in that instant knit together in his mind.

Artesha went on, "But what is the reason for all this? Have the missing parts of my memory passed through that fifth-dimensional gap Wymarin suggested—to be going-doubles of another Artesha somewhere else, and unify the continuum? Why have none come to me? Is the unification of the continuum more important than the survival of the human race, and in *whose* opinion?"

"You're better qualified to answer questions like those than anyone else in history," said Magwareet soberly. "Why ask me?"

"How can I trust myself any longer?" said Artesha, and Magwareet, in a horrifying access of vivid imagination, pictured the breakdown of the entire structure of human effort, through the failure of the support it all relied on. He had to do something swiftly. What was still human of Artesha required comfort, friendship and reassurance like anyone else; Burma had long been accustomed to provide it, Magwareet knew, but Burma was *somewhen* at the back of Time.

"There's one thing you can be certain of," he said in a matter-of-fact tone. "That is that all these putative Arteshas, like yourself, are working towards the survival of the human race. You can't do anything else, can you?"

"No," Artesha agreed.

"Have you, since discovering that the Enemy are more interested in destroying the Being than ourselves, studied the possibility of combining with them to do that? After all, we'd be as glad as anyone to get the Being off our necks!"

"We can't do that," said Artesha firmly.

"Why?"

"Because—" Artesha's first word was assured, but it stopped as if cut off with a switch. "Why, I know—I know there is a reason, but that must be in the missing banks, too!"

"Where did you get your information from? Kepthin?" Artesha confirmed that fact. "All right, I'm going down to see him. That, at least, we can settle definitely." He started towards the door.

"Magwareet!" Artesha called after him. "Do you think I should go on trying?"

"Yes!" said Magwareet forcefully, and went out.

Magwareet left the presence of Artesha and went down to see the little biologist in his research hall. He found him *on his way, a general call from Artesha came to him over the Enemy signals which were now being intercepted. When communicators, and at her urgent command he returned the* Magwareet broached his idea, however, Kepthin shook his head.

"No, the idea is impossible. What it amounts to is this : the Enemy discovered the existence and possibly also the nature of the Being before we did. (How far it extends, I won't dare guess !) It was the first non-Enemy life form they had ever run across, and they've spread over several planetary systems—about twice as many as we have, I believe. Their background is one of extreme hostility between species, on their home world. They don't keep pets, for instance. So when they discovered the Being localised in the area we inhabit, we automatically became a parallel object for attack. No, getting rid of the Being by joint effort is out of the question."

Magwareet, of course, was completely unaware of what had happened, and Artesha's statement to him was a shock. "I'm where ?" he said.

"According to my instruments, you are at present in the Enemy research hall, talking with Kepthin. Listen !"

Artesha opened a communicator, and Magwareet, wondering, heard his own voice mingling with the biologist's in conversation.

"Let's see what happens to this going-double when I call them up," said Artesha grimly. She threw in alarm circuits which shut off the research hall where Magwareet—Magwareet found it upsetting to think of himself in the third person—was, and alerted nearby personnel. Then she spoke.

"Magwareet ! Kepthin !"

"Magwareet's not here," said Kepthin blankly. "Why, what is it ?"

"Not there ?" Artesha consulted her instruments again.

"What's the alarm for ?" Kepthin pursued. "You're interrupting our work, I'm afraid."

Artesha couldn't answer. She shut off the communicator and spoke blankly to Magwareet. "Didn't you hear for yourself? Magwareet, *how?*"

"Find out from Wymarin if there's been any activity from the Being over the past few moments," directed Magwareet. Things were falling into place in his mind. There was a beautiful simplicity about their arrangement which was almost aesthetically satisfying; it made him certain that he was on the track of a right answer at long last.

"Yes," was Wymarin's report. "Very considerable activity! No temporal surges, but these associated side-effects which I told you were also found when a going-double appeared."

"What I hoped to hear!" said Magwareet jubilantly. "Artesha, listen to this. Let's suppose that the Being does know we're not actively hostile, and the Enemy are. Let's furthermore postulate that it *really* exists in four dimensions, and is free to move through all of them as we are through three.

"Now suppose that *we* artificially move in time. Our actions create alternative presents. There must be hundreds resulting from our recent interference with the time-stream. But the Being's actions *don't* have this result. It would be a contradiction in terms. The Being, we can say, regards our alternative presents as identical, despite their possible superficial differences.

"It appears likely that the Being is responsible for the going-doubles, doesn't it? I think that what it is actually doing is attempting to assist us in our struggle with the Enemy—witness, for example, the appearance of Wymarin's going-double with what Burma thought, before he knew it was a going-double he was speaking to, was a workable plan for communicating with the Being. I don't know in which alternative present that plan was hatched, but I suspect the Being approved of it."

"A hell of a lot of assistance it's given us!" said Artesha bitterly. "It's stripped our defences with its temporal surges and left us naked to the Enemy over billions of cubic miles of space. I hope you're wrong, Magwareet, because if the Being *is* taking a hand in our affairs, and we remain without a means of talking to it, how will we ever know what's going on?"

"Only the Being can do that, in all probability," Magwareet answered sombrely. "But if my theory is right, it *does* know, because in all those parallel presents it is precisely the same. Our interference with the time-stream doesn't affect the Being in the slightest."

He broke off. "I wonder if the fact that my going-double appeared to Kepthin means that he doesn't have a duplicate—exists only in this time."

"He *must* have a duplicate," contradicted Artesha. "He said that you hadn't been down there, didn't he? The other Magwareet must have been talking to another Kepthin—"

"And yet you noticed them!" exclaimed Magwareet. "They must have been together in this time—either that, or you are breaking through the fifth-dimensional barrier."

"Then it is the Being who has been interfering with my mind," said Artesha stonily. "And the mess it has got us into—"

At approximately that same instant every communicator in Centre awoke to life, as well as every one in the entire surviving defence fleet.

"Plan Red," said a crisp voice which didn't quite conceal a hint of panic. "Repeat, Plan Red. Enemy fleet approaching Solar System from direction Cetus. About one thousand nine hundred major warships, about fourteen thousand medium-class warships, twenty-six thousand raiders and scouts upwards of a hundred thousand. Plan Red!"

"Well?" said Artesha. "At least they aren't coming towards the biggest gap in our defences, but they'll find it soon enough. I think this is our last meeting, Magwareet, unless we eventually get a chance to pull off Plan Black. It's been nice knowing you."

"The human race has got itself out of some pretty tight corners before now," Magwareet reminded her. "And, as you say, we may manage to pull off Plan Black. See you later!"

On that note of false optimism, he hastened to take up the place prescribed for him in Plan Red.

Plan Red had been Artesha's greatest achievement. It was a means of mobilising the entire defensive potential of the human race. Every man and woman in the Solar System, and every child old enough to be of use, had a part in it. At

the last announcement, they had left inessential tasks and gone to essential ones:

Magwareet's, like the other top co-ordinators', was in the master operations room. It was anticipated that the influx of data would swamp even Artesha's immense resources for computing. Therefore there were made available people who—like Magwareet—had the co-ordinator's gift of snap decisions on the basis of inadequate information.

He was barely settling into place before the banked communicators, time maps and viewscreens which would be his ears and eyes for as long as the battle lasted, when Artesha came through. "Magwareet; handle Plan Black, will you? As soon as you've attended to it, cut back into Plan Red."

"Right," confirmed Magwareet, and studied the set-up.

Plan Black was the last-ditch one. It was known that the Enemy's first move on discovering man had been to englobe the systems the race inhabited; that was why no one knew where the Enemy actually came from. They had been uncertain for a long time which was humanity's home world, but—inevitably—the slow withdrawals they had forced had led them to the correct conclusion. They had never before assembled so large a fleet to reduce a single system.

It was suspected that from some of the outermost colonies small groups had broken away and penetrated the Enemy's space in search of planets beyond their influence. But it was not certain. Perhaps they had found safety and would ensure the race's survival; perhaps not. In any case, it was probable that the victorious Enemy would hunt them down and mop them up after Earth was defeated.

Therefore—Plan Black.

Centre was the nucleus of it. On the closing of one of many thousand switches, at the very last moment possible, all the ships composing Centre—or rather, those which had survived—would immediately be thrown into faster-than-light drive. There was no way of reversing the process, short of mechanical failure or reduction of the available power below a certain minimum. Even at the emergency limit of the drive, it would be years before the crew of those ships saw starlight again.

Thus, like the bursting of a spore pod, the human race would erupt outwards among the stars. Some of the ships would be hunted down; some would emerge from the star-drive impossibly far from a GO-type sun; some few would collide with the worldlines of stars or planets and explode into dust.

But some fewer still might perhaps fall within reach of habitable planets thousands of light-years beyond the Enemy. It would be the greatest gamble in history—but it might spell survival.

There was only one person whose chance of that was negligible to the vanishing point, and that was Artesha. Her very mind was spread over so many ships that it was virtually inconceivable that she should live through Plan Black.

Like all other co-ordinators, Magwareet had calculated the chances of survival from that plan so often that he knew its details by heart. It took him minutes only to carry out all that was necessary to prepare for it—to activate the switches Artesha, or one of her deputies, could throw. Then he turned his attention to the developing battle.

How is the Being going to like this? he wondered as he thought of the gigantic release of energies it would entail. *What a handicap to fight under!*

Artesha was massing the available defence fleet along the Enemy's line of attack; it was the only possible move. There was something enormously impressive about this sight of the concerted power of a whole race—

Until one looked at what it was opposing, that was. Magwareet felt his heart sink as he considered how mankind was outnumbered.

Seeing an opening to join battle, he awaited no orders from Artesha, but ordered up a squadron of heavies to take out the jutting wing of scouts closest to the ecliptic. It was over in moments, and scattered wreckage drifted in space.

The first casualty report came in. "Forty-eight Enemy scouts destroyed," said an unemotional voice. "Our losses—one cruiser disabled, five damaged."

Heartened, Magwareet's companions bent to their controls. But before the next blow could be struck, a voice full of panic rang from the communicators.

"Unidentified fleet approaching from direction Ursa! Repeat, *unidentified!* And there look like millions of ships!"

Ursa! Straight for the gap in the defences!

XX

Time is a river ?

Time is an arrow ? The movement of the hands on a watch ? Something an atom vibrates in ? There is an adequate answer to all these suggestions. Nuts !

Time is an accidental by-product of the biological process.

Take something—a star, say. It moves : now it is here, now there, but one cannot say if it is moving or the other stars are moving. At one moment it is in one place—but it is equally correct to say it is in one moment at one place. Move it in space, move it in time.

Move it in time, to a moment when it already exists. It is the same star. Unless it is also moved in space, it is indistinguishable from its earlier self. But if it is in another place at the same moment—?

If you can move it in time at all, you can move it so that it occupies not two places at once, but one moment in two places. It can, after all, occupy one place at two moments !

The electrochemical process resulting in the localised reversal of entropy known as “life” might be insulated, so to speak—its reversal of entropy converted into an identification with the law of nature alluded to above.

A star, moved back in time, is itself at the earlier moment. An organism, aware of the fact that it has been moved, is not. In obedience to the special laws of biology, it will proceed to move “forwards in time” again at its habitual rate. Let it become aware of the co-existence of itself in the moments it occupies, and it is no longer one, but two, selves.

The discovery of time travel, in fact, is the first step only towards emancipation from the law of Time governing life-forms. But it is a step which brings them right up to the threshold of eternity.

It was the only time Red and Chantal had ever seen, or were ever to see, Burma at a loss for words. He stumblongued for fully a minute, before he made a completely incomprehensible remark to Vyko.

“Of course ! I see why not. But why here ? Why now ?”

“Here is irrelevant. So is now. We are either at the very beginning of the universe, or the very end. That is to say, we are past a point at which the actions of any intelligent being—except myself—are of significance. But it was not

until you had passed, as you count time, the point at which you entered this last temporal surge, that you could be of service in exactly the way necessary."

So *that* was why Burma's use of "ago" in speaking of the far future was so oddly meaningful! Red felt astonished at his own intuition, but he had a complete vision of the universe as it must be in exactly the same way that he "felt" a sculpture before he commenced work on it—neither visualising it, nor imagining its tactile qualities, but a non-separable combination of the two. He could not have drawn a view of one of the works he intended, for the flat projection of it would not have been the same thing. Only under his hands and eyes together could he capture the essential quality he was looking for.

But there was a question he had to ask. "You brought us here for a purpose," he said bluntly. "If you can communicate with us now, you could have done so at any time. All times are alike to you in four dimensions. What is that purpose?"

"It is exactly because all times are alike to me," said Vyko's voice, "that you, as you are, are here now. Burma, you are my interpreter. This boy Vyko is my mouth, because his is the only mind among you which is able to contain four-dimensional concepts naturally. For the others of you—all but two!—I have certain small individual tasks which anyone else might have carried out."

Which other two? They looked at one another questioningly. Vyko continued to utter the Being's words.

"My purpose, since you ask it, is simple. To defeat the race which you call the Enemy, since they are intent on destroying me."

"But could they?" said Chantal wonderingly.

"Because I propose to destroy *them*, no!"

And then, all of a sudden, a peculiar thing happened. Vyko's face for a moment went slack and relaxed. At the same instant, Burma's lit up with sudden delight, and he seemed to be listening to something. Then the same thing happened to one of the members of the crew, and another, and another, in rapid sequence. Chantal's expression changed in the same way.

These are the tasks he is choosing for us, thought Red. He wondered what his could be. It was quite natural for him to start thinking of the Being as masculine, since Vyko's youthful but definitely male voice rang in his memory.

Then there was something in his head that was like a memory speaking, but was not one. It said : *You are one of the two needed for a special task.* It said : *You are a sculptor with a sculptor's mind and a sculptor's way of looking at space.* It said : *There could be nothing greater for you than to create with pure space and pure time as well.* It said : *You are to supply what is needful.*

It said : *You are to help in moulding the universe itself.*

They had exactly enough time to become frightened after the panicky voice announced the oncoming, unidentified fleet. Magwareet flinched rather than deliberately moved his head to look across his detector screens, and saw that the wild estimate of the number of ships—millions of them—must be very nearly correct. At least there were hundreds of thousands of them.

But it was another thing he noticed on the screens that really shook him. Forgetting that she would already know, he called to Artesha.

"Artesha ! You've got your memory back !"

"Yes, I have," said her calm, controlled voice, and he heard a sureness in it that he had been hoping for for an age. "Listen to this, please."

From the communicators throughout Centre and throughout the ships of the defending fleet a voice, quiet and firm, spoke out. It was a voice he recognised.

"I am placing my fleet of approximately one million vessels at the disposal of Centre for the duration of the present operation. Please begin to compute with them in your attack plan."

Burma's voice !

Perhaps the Being might know from what unimaginable resource of time or space he had dredged up a million fighting craft. Time enough to worry about that later. Right now, there was a war to be won.

Another race allying with us ? Where from ?

What about—afterwards ? They outnumber us hopelessly !

And then Artesha put sixty thousand ships at his orders, and he began to fight them.

The formation of the Enemy was their standard one : a hemisphere, hollow face towards the Solar System, with a single line of heavy craft jutting from its centre and two flat

wings of scouts in the plane of the System's ecliptic. The nearest of the scouts had been half a light year away when Magwareet has sent in his first attack. That distance had already dropped by a quarter, and the minor gap in the formation which he had caused had been filled.

The technique was simple and effective. The jutting spearhead was just out of range of the heaviest weapons carried by the ships at the rim of the semi-circle—but only just. It was their business to transfix the oncoming ships like a butterfly on a pin. Whichever way the defenders tried to take evasive action, they would find themselves coming within range of the ships in the hemisphere, who could fire on them without endangering their companions.

By the time the engagement was properly joined, the hemisphere would have begun to contract into a sphere, enclosing their opponents and squeezing them like a ripe orange.

If, by some miscalculation, the fleet proved to be outnumbered, out-gunned or out-fought, the spearhead could accelerate just a little and close the front of the hemisphere, which would thereupon become the rear, concentrating the heaviest armaments on the pursuers.

Of course, the exact diameter of the fleet, its numbers and composition had been worked out in view of the Enemy's knowledge of the human ships' performance, to make certain they could not be encircled before they reached the Solar System. *But*, thought Magwareet with a savage and primitive joy, *they weren't counting on this!*

He had his ships, and an extent of space to marshal them in. Summing up the situation as it developed, he made his plans—with alternatives—submitted them to Artesha as fast as he could talk, received her approval, and waited.

The oncoming spearhead was within a quarter of a light-year when the original defending fleet struck home.

They had re-formed as a cone, point exactly aligned with the heart of the jutting Enemy spearhead. Their degree of stagger was precisely judged so that the rear ships could distract the Enemy on the rim of the hemisphere while the main vanguard penetrated the middle.

Only this time, unlike many previous times, the head of the cone held its course.

It was like—like crushing together two candles against a red-hot stove. The tip of the cone melted away. So did that of the jutting spearhead. But as the cone grew shorter it

grew wider, and soon the spearhead was dwindling the faster of the two.

This was allowed for, of course. The ships at the rear of the hemispherical bowl were there for just that reason. The closer the defenders came, the more withering the fire they had to withstand.

If we'd been on our own—! thought Magwareet sombrely. There could have been only one end to that struggle. But they were not on their own.

The battle, as a unit, was now creeping towards the Solar System, from its original direction of Cetus, south of the ecliptic. Thus far, the original plan had been adhered to. The Enemy was making his inevitable progress. Now, soon, he would judge that enough of the defences had been drawn from their regular beats, and send half one of his wings of scouts to try and carry the fight into the System itself. They would probably, knowing men were oxygen breathers, drive for Earth direct, for in the past they had often enough launched over-driven missiles at it from far out in space. That was all right. It was only if they deduced—correctly—that Earth had been evacuated that they would turn their attention exclusively to Centre.

Abruptly, Magwareet's estimate proved right. The scouts went into maximum emergency drive and swung north towards the gap in the defences facing Ursa Major. And stopped as if they had hit a wall.

For, awaiting them there, was a squadron of the newly arrived ships with drives cold, armaments switched off, and screens up in every conceivable electromagnetic and gravitic waveband. The scouts fought like hornets, but they were swamped.

The Enemy reacted quickly. He realised he had walked into an ambush, but assumed that where so heavy a concentration of ships had been made, another place must have been left thin. A ring of ships disappeared from the bowl of the hemisphere, and struck at about the orbit of the asteroids from the direction of Argo. This time, he was temporarily right, and Magwareet's heart sank, for this was the System's most vulnerable area.

The defending ships, lying in wait, took a few seconds to counter the blow. In that time, destruction had been sown broadcast, and Magwareet was horrified to see that one of the

last Enemy to be destroyed had vaporised ten of the outlying components of Centre.

Artesha !

Then he blinked, for the wrecked ships were instantly *back*, where they had been before. "Where—where did they come from?" he gasped, before he realised it was aloud.

"From the same place as the rest of the ships," said Artesha, with a hint of a chuckle. "You can stop worrying, Magwareet. We've won. It's only a matter of time."

Silently, beyond the limit of the Enemy's detector range, the friendly strangers had crept around the Solar System. Now some of them—most of them—dropped the pretence and made themselves known. The fleet of the Enemy melted like ice in hot sunlight.

Magwareet laughed aloud in sheer joy as he saw what was happening, and grew suddenly aware that someone had brought refreshments to him where he sat. Astonished, he noticed that the battle had been in progress nine hours.

The person who had brought his refreshments was a boy, no more than ten years old—one of those who had a place, an essential though minor one, in Plan Red. Seeing Magwareet turn from his screen, he risked a question in high eager tones.

"How's it going, Co-ordinator?"

"Well!" said Magwareet with a smile.

The tattered remnants of the Enemy were scrambling out of range as fast as they could, back the way they had come. Magwareet gave them enough time to feel secure, and then, only then, revealed what he had quietly been attending to all this time.

In those nine hours, sixty thousand ships had stolen with their screens up to the rear of the Enemy. When the remnants were already among them, they showed themselves. Out-numbering the Enemy as they now did, by three to one, they finished the job.

Completely.

Ten hours from the start of the battle, there was nothing left of the Enemy's proud armada—except dust.

XXI

For the first long moment it seemed to Red as if he was looking down on the universe like a flat, broad road racing past beneath him. Then he remembered that this was not possible, and his mind rebelled. He found the presence of the Being in his head, supporting and strengthening him.

There was something about the touch—touch? It was nearer to that than anything. He felt it in exactly the same way he appreciated the form of a sculpture before he began work on it. There was something *feminine* in it.

And then he understood.

“Artesha!”

“Yes, Red. I am the Being. That is knowledge I have had to conceal even from myself before I discovered what I was.”

“How—?”

“By insulating certain memory banks, and filching them away when there was danger of my guessing correctly before I actually did guess correctly.”

“But—”

“I am no longer *in* time, Red! There’s no paradox, for by becoming as I am I grew into four dimensions. After—when there was never to be any more ‘after’ for me—why should I not control my earlier self? After all, I had already done so, so far as my earlier self was concerned.”

“But then—” Red’s mind leapt ahead with the swiftness of intuition, “—then you have no more purpose in existing! You have nothing but the present!”

“Exactly. But there is nothing *after* it, because there is no more ‘after.’ Look, since you are puzzled, and I will show you.” She did so, without words, and when it was over Red felt a little faint, but he understood.

“A present in which one is directing the universe is no small one,” Artesha commented dryly. “Now, Red, this is what you have to do. You have a certain way of appreciating form, and space, and of effecting meaningful changes in it. I need that. Because I am completed, and cannot change again, I must borrow it from you.”

A small area of the road which was the universe stilled within Red’s comprehension, and he studied it. Somehow, it was blurred. He recalled Vyko’s description of trying to look into the future of someone with a going-double.

Artesha—focused—it for him, and he realised it was the span of human history. “Why is it blurred?” he asked.

“Because of time travel, and temporal surges,” Artesha told him. “There are several presents at this point of the universe—do you see? What we must do is to choose certain ones which are best for our purpose, mould them so that they are ideal. Then, at a certain point, we must bring them together, fold the present into one present, and—”

“And?”

“And that is all.”

He studied the various parallel presents for a while, getting to know the subtleties which distinguished them. He could not quite work out how they were separated, because each and every one of them was *the* present. Something occurred to him, and he asked, “Why are there no presents in which the human race loses its war to the Enemy?”

“Because the human race wins its war,” was the answer, and it seemed sufficient.

“These,” he said after another short while, as he might have selected a particular stone or clay mixture for a sculpture.

“They are yours, to do with as you like.”

Then began for Red the sheerest ecstasy he could ever have imagined. The timestreams were like clay under his hand, and yet the appreciation of them was not confined to his touch and sight. It was like creating an objective sculpture in his mind alone.

At first he was hesitant, but then he became absorbed in the joy of pure creation, and gave himself up to it.

It was necessary that certain actions occur at certain points. It was very necessary that a sculptor called Red Hawkins should be available at one point; that a Croceraunian war party should do certain things in a time not its own, and that a staff magician called Vyko should not die. These things gave basic form and balance to the creation, like the wire framework for a clay model.

But that was only the beginning. There were details, each tiny, each tending towards the perfection of the completed work. It was also necessary that certain people with an influence on scientific thought should be puzzled by the behaviour of sub-atomic particles; that they should scratch their heads over the impossible appearance of a prehistoric monster in the twentieth century. A prophet had to have a vision of angels, and certain aircraft had to be lost to cause it.

It was necessary that a certain warship should sail with her superstructure burning across a boiling sea in the dim dawn of time, and that the crew of another vessel should build themselves shanties of cycad wood on the shores of a carboniferous swamp. Time and natural processes erased the name they had carved to give them an anchor to reality on one of the shanties : *Marie Celeste*.

It was necessary that an army commanded by a king called Cambyzes who had dreams of empire should be defeated by the savagery of a snowstorm deep in the Antarctic. A man called Bierce and another called Bathurst and thousands upon thousands of them had to do something at particular times. For the luckier ones, it was an inexplicable mystery ; for the less fortunate, it was hell, or insanity.

And on, and on, and on . . .

Until at last, there were five presents, and each of them was designed to fit into the others like dovetails.

Red tried to look ahead into the moment when his work would take its definitive form. He failed, because the effort of distinguishing between the five timestreams now was too great.

"What have we done ?" he said, conscious only of an all-embracing weariness which was the end product of having achieved something more than his greatest ambitions.

"You have given the human race a fleet to win its war with," said Artesha. "Watch."

Red did not understand how it was done, but the separate presents—folded—together and became one, and the objects which were important were in their proper place.

"So it was I who forced those temporal surges," he said. "And it was I who created the going-doubles." He remembered but the memory was a poor shadow compared with the omnipotence he had briefly known.

Briefly ? In a single *now*, like the *now* Artesha in her guise of the Being experienced. But she did not have to return from it to the tyranny of slow-seeping time. She had crossed the threshold of eternity. Almost, he found it in his heart to envy her.

"Listen !" said Artesha, and he heard Būrma's voice.

"I am placing my fleet of approximately one million vessels at the disposal of Centre . . ."

The going-doubles had effected the final, incredibly delicate adjustments of the parallel presents. Now, it was complete.

"Now I have something else to do," said Artesha. "I have to alter—very slightly—the whole pattern of the universe, because it is now running, as one might say, at a small angle to the path it can most easily follow."

There was a brief pause. "After I have done so," Artesha went on, her tone seeming to change subtly, "I shall have achieved my purpose, and you will no longer know me. There is a little time—for you—in which you can ask questions if you wish."

Red cudgelled his tired brain. After omnipotence, omniscience . . .

"What is the eventual fate of the human race?" he said slowly, and knew as he asked what the answer must be.

"The same as that of the universe. To—keep going—and stop."

No, that direction was no good. There were too many questions to ask. He changed his mind. "Who was the other person with a special task?" he said. "What was it?"

"Chantal was the other person," said Artesha. "And her task—You know, I think."

"Burma," said Red with complete certainty.

"Of course. That is the one personal desire I have allowed myself in all this work. That is why I have something still to put right. Out of all the re-shaping of history we have undertaken, I have left over one special person, who because of what was done was exactly the right person."

Some deep-sunk part of Red's mind flashed—like sunlight caught on a turning mirror—with a hint of jealousy. But his entire being was too suffused with the weariness of utter satisfaction for it to rise to the surface.

"It was too much, and had been for too long, to ask Burma to love a person trapped in metal," said Artesha, with her last hint of melancholy and pity.

Red knew that his tiredness would overtake him and drown him in only a moment. Forcing himself to form the words, he asked, "And what is your purpose—the one you will now achieve?"

"I shall have created myself as I am," said Artesha, and took two planetary bodies away from the Solar System at precisely selected instants of time. The work was no longer perfect, for there was nothing imperfect to compare it to.

It was all there was.

Magwareet stretched himself and rose to his feet. The defence of the Solar System was over. The power of the Enemy was broken, and in due course the still mighty fleet of Earth (it was good to be able to think that again ! How wonderful to walk under blue sky, breathe air without remembering that it was accounted for litre by litre !) would search man's opponents out and finish the job.

Burma, still a little awed at the magnitude of the disaster which had overwhelmed the Enemy, completed the task of assessing his casualties—which were light—and filed the report with Centre. Turning away, he found himself looking at a girl with brown hair and a tiptilted nose, and for the first time since Artesha's accident found himself admiring another woman without guilt.

Wymarin stared at his instruments, hoping to find a hint of how a fleet whose members almost precisely duplicated the ships already in space in the Solar System had penetrated what he still thought of as the fifth dimension.

Keptin heard the news of the Enemy's defeat, took a shot of issue alcohol, and went to the research hall where the captured specimen waited dumbly in the confinement they had imposed on him at the beginning of Plan Red. "You poor bastard," the biologist said softly, and wondered in the same instant whether pity was not wasted on the creature. But there was no further need of this specimen now, and on a sudden impulse he brought a gun from a nearby arms rack and ended the Enemy's life.

Vyko awoke from some sort of a deep trance, wondering how it could be that the going-doubles of the people about him no longer affected his visions of the future, discovered that half a day had elapsed, and went to ask someone what had happened. He found time to ask himself how Chasnik, his former captain, would have reacted to the news that his staff magician would wind up planning the actions of a fleet of spacecraft mopping up among the Enemy.

Artesha took in the battle casualty reports with part of her mind ; with the rest, she was engaged in analysing the fantastic facts stored in the data banks of the section of her memory which had been restored to her at the outset of the battle. It would be a long job, but there was a promise of *something* at the end of it . . .

Artesha began to discover what she had hidden from herself about herself. In so doing, she began to create herself.

Except that she already *was*, and had been since the beginning and would be until almost the end of Time. Even the Being, she knew, required the universe in which to *be*.

This was neither the beginning, nor the end, for there is, was and will be, nothing but everything, which is the universe.

EPILOGUE

Los Angeles Herald, 16th March, 1957: SCULPTOR DIES IN FREAK ACCIDENT. Lightning claims well-known victim. Three Waters, 15th March. Victim of a freak lightning strike was sculptor Lawrence Hawkins at his home near here last night. A bolt struck the artificial leg he wore as the result of a childhood highway smash in which his parents were killed. Dr. Meade J. Calloway, who carried out an examination of his body, said death was instantaneous.

The Weather Bureau reported no thunderstorms in the area on the night in question. Chief Meteorologist Jack Ellis commented, "It may have been due to static electricity building up in a pocket of dry air. Weather does funny things sometimes."

Hawkins's death will be regretted in Californian art-loving circles. Still in his thirties, he was held to have great promise. He was unmarried.

John Brunner

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written and illustrated by
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Fiction

When a scientist or astronomer Fred Hoyle's stature offers his first science fiction novel, some of the fireworks of his controversial *Nature of the Universe* and the exposition of his *Frontiers of Science* are rather expected. But in **The Black Cloud** (Heinemann, 15/-) Mr. Hoyle's fiction suffers from a welter of scientific garrulity and a lack of smooth novelisation. Which is a pity because he brings to a grim (but hackneyed) plot of potential Terran destruction by an extra-solar menace, a keenly analytical mind, a knowledge of scientific administration and a solid (if rather indigestible) command of language. Even—for a sober scientist—an audacious denouement anent the cosmic cloud, which I must not reveal.

I find it difficult to pin-point my dissatisfaction of its first reading as a novel, and will readily admit to a personal bias against a science fiction novel larded with interminable (and sometimes abstruse) science, and which at the same time lacks the pace to sustain such a long story. I found the BBC's radio adaptation more acceptable but I fear that the first few minutes of even this may have caused many a switch-off among its audience. I think I can best sum up my instinctive lack of approval by referring to the author's preface which opens with the declamation "I hope my scientific colleagues will enjoy this frolic." Perhaps it is only a big joke and I missed the point. But if this is Mr. Hoyle's idea of a frolic then I will hate to read his "serious" novel. Come again, Mr. Hoyle, with a new streamlined technique, and I am sure I will be tremendously enthusiastic.

Non-Fiction

One of the peculiarities of fantasy and science fiction is such that its early roots and its often most unlikely and widely dispersed emergencies in general imaginative literature,

lend themselves admirably to research, bibliography and discussion of influence by various authors. Apart from Prof. J. O. Bailey's *Pilgrims Through Space and Time*, and to a lesser extent Patrick Moore's recent *Science and Fiction*, previously published treatises have tended to specialise on a particular author or at least a specific trend, notably space travel in fiction. As a comparable, but more detailed and soundly analysed, volume of the genre compiled solely from the magazine field has yet to appear—what a valuable and interesting book this could be!—it is inevitable that much duplication of subject matter has arisen, and each new review must be judged on its author's approach to his research.

On this basis a grateful welcome is extended to Roger Lancelyn Green's *Into Other Worlds* (Abelard-Schuman, 16/-). A scholarly and most able author in his own right, Mr. Green has the soul of a poet, a confessed affection for this type of fantasy, and no scientific axe to grind. He writes interestingly and well of the now familiar (and some lesser known) historic space-travel romances, extracts the meat from difficult-to-read (and equally scarce) novels of the Victorian era, sensibly discusses Verne and Wells in this specific aspect of their work, very fairly evaluates the position of Edgar Rice Burroughs, and goes no further chronologically than a deservedly approving appraisal of C. S. Lewis's unique trilogy.

Within these limitations, but with copious and effective quotations from the books under scrutiny, he presents a fascinating study of man's fancies and speculations on voyaging to other planets before modern science has practically paved the way for the cold and logical fact of actual space travel.

Antithetically, Terry Maloney's *Other Worlds In Space* (Acorn Press, 12/6) is a description of the Solar System and its planetary components, based on modern astronomical knowledge, and, inevitably, some modern scientific *speculation*. A corollary to the main theme is a discussion of methods of observation, artificial satellites and space travel. The extreme readability of the text is enhanced by profuse black and white illustrations and photographs, and many admirable coloured planetary vistas by the author.

Leslie Flood



Bootle, Lancs.

Dear Mr. Carnell,

I am writing partly in reply to your January 1958 Editorial and partly to comment upon the last six months of your magazines.

I was very pleased when you dropped interiors in issue 62; they had been spoiling the magazine for quite some time. However, I regret to repeat that I am far from happy about the covers. Terry is quite competent but far from outstanding (as were Quinn and Clothier in their hey-day). I am now in possession of *New Worlds* Nos. 30 - 67 inclusive and odd issues from even earlier, and it is quite clear that your artwork has deteriorated gradually over the past two years. Lewis in particular has done a great deal to spoil the appearance of the book. His covers for 61 and 64 are bad enough but No. 66! I would honestly prefer to buy *New Worlds* in a brown-paper cover rather than see another effort like this. It would have been bad enough as an interior but as a cover it was unforgivable. You have probably gathered from this tirade that I welcome your announcement of abstract art for the cover. As far as I can see this is the only answer apart from strictly factual covers (such as No. 67 and the earlier Bradshaw paintings) which are inevitably limited in their subject matter.

Well, I've said quite a lot against the magazine now let us take a look at the credit side. Issues 61 to 67: excellent stories, very interesting articles and also intelligent editorials (a rare thing in science fiction magazines). I agree with your remark about stories being given a new approach by writers, and I would like to add to the names of Phillips and Aldiss that of Bertram Chandler, who I think is a short story writer second only to Bradbury (within the genre, of course). John Brunner has established himself as your best author (although, I have not yet read "Threshold of Eternity," it promises to be excellent). Kenneth Bulmer runs Brunner a close second

(perhaps only because his output is not so prolific). I liked Morgan's serial and thought it greatly superior to "Wild Talent" both in plot and characterisation. Issue 63 illustrated the fact that Peter Hawkins has not lived up to the promise of "The Tools of Orlas Boyn." This whole issue in fact was not very good, but it is virtually impossible to keep your high standard every issue.

I have been rather disturbed by the thought that you were relying upon the old hands too much instead of finding new blood, but three authors in particular have allayed my fears, I refer to J. G. Ballard, whose "Manhole 69" was quite gripping (and incidentally an example of the new approach), D. M. Parks and Donald Malcolm. Another writer who interested me was Paul McClelland (I hope he isn't discouraged by the poor rating in the Line-up). I am also pleased to see that Tubb is contributing another story after two years' absence.

As far as *Science Fantasy* is concerned the cover-work is more promising; Rubios is probably the best artist you have ever had and even Lewis turned in a good cover for No. 26. In the story department the past four issues have varied. On the whole they have been good but No. 24 was your weaker issue to date. (Mainly because of two very bad novelettes, "Plague" and "Blind Chance.") In this field the stalwarts are again Brunner and Bulmer with Silverberg and Kippax close behind and of course, the indefatigable Bertram Chandler. New writers? John Brody, Edward Mackin, Justin Blake—only three but all promising.

Well after that epistle I close by saying that you are still producing the second best magazine in the world (*New Worlds*) and incidentally, the 5th best too (*Science Fantasy*).

Graham A. Riley.

P.S.—Full marks for the Heinlein story (do that again please).

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